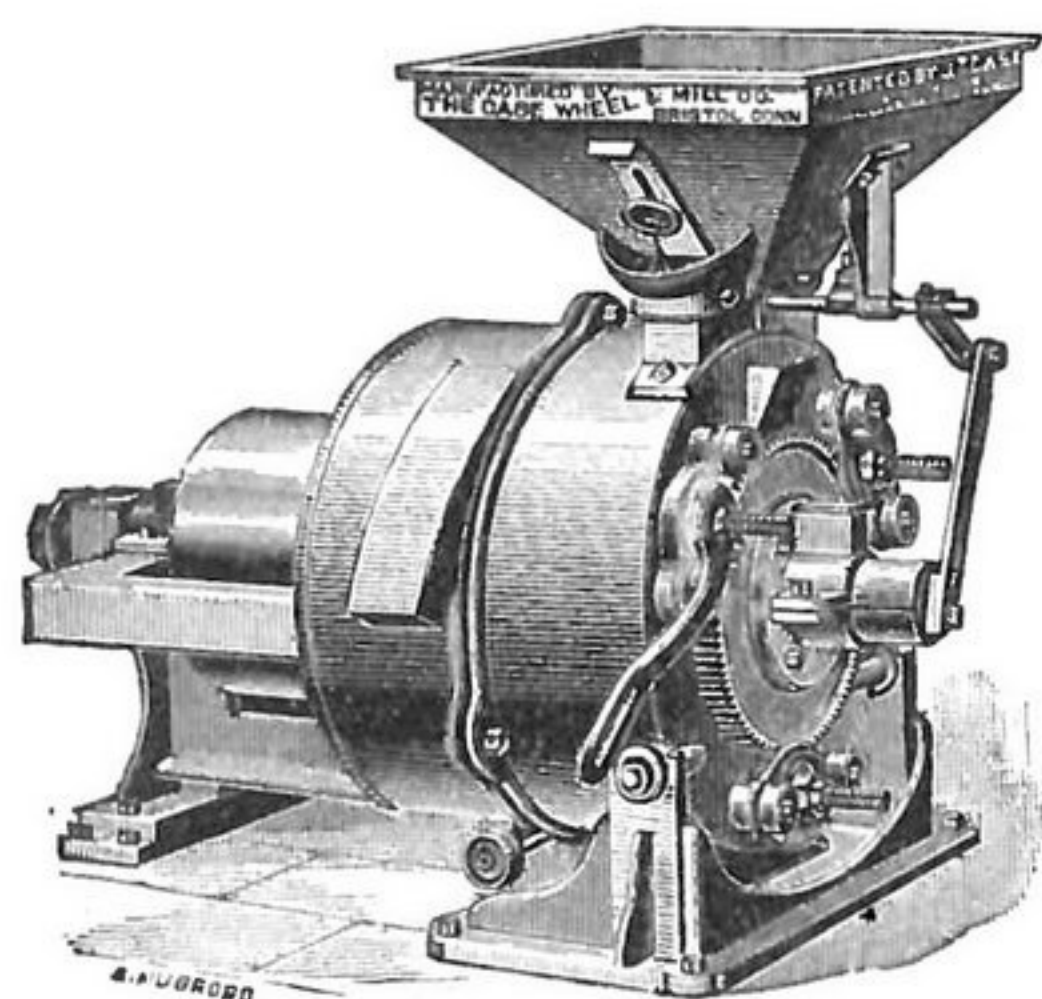


PUBLISHED EVERY MONDAY MORNING.

VOL. XXII. No. 5.

BUFFALO, N. Y., MARCH 31, 1890.

\$1.50 PER YEAR.



## VICTORY OVER ALL OTHERS. SINGLE & DOUBLE VERTICAL GRINDING MILLS. (J. T. CASE'S PATENT.)

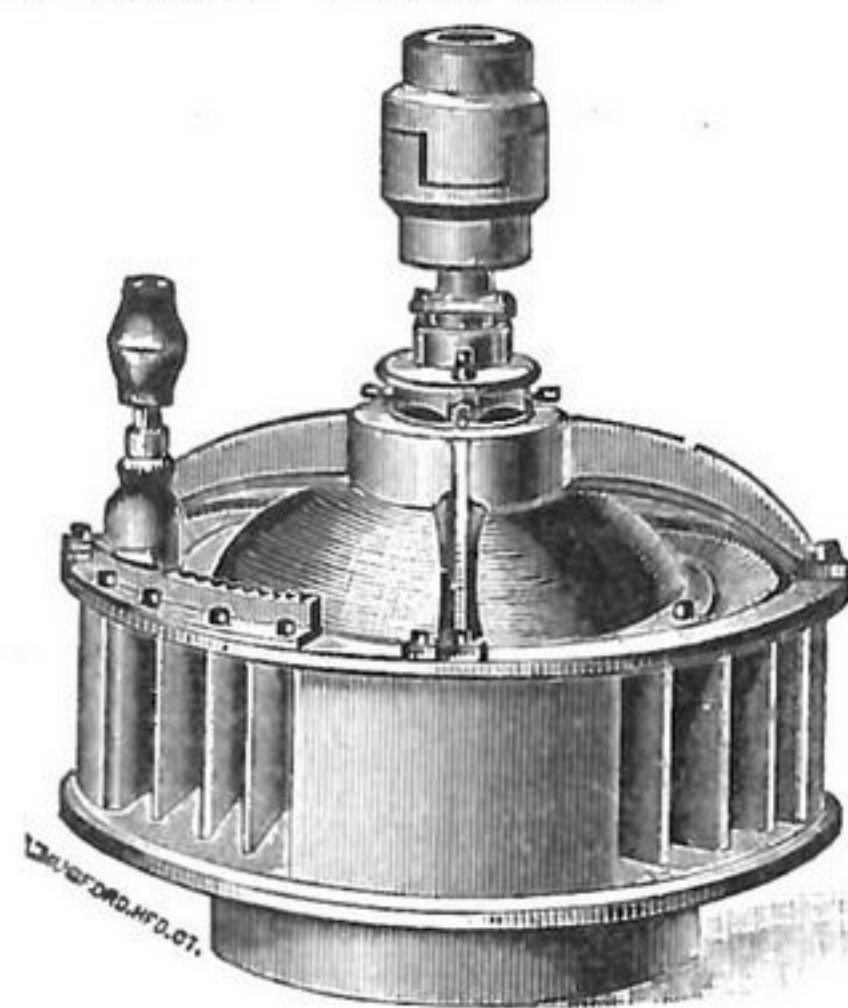
FACTS ARE MIGHTIER THAN ASSERTIONS. READ WHAT THEY SAY:

"Our 20-inch mill made by the Case Wheel & Mill Co. is in every respect satisfactory, easy to handle, and best results obtained of any mill in the country, with same quantity coal and power."—A. S. RUSSELL & Co., Meriden, Conn.  
"Superior to any mill in use."—GEO. WESTON, Bristol, Conn.  
"The best satisfaction in quantity and quality."—CHILD'S ELEVATOR, Manchester, Ct.  
"We take pleasure in recommending it."—GARLAND, LINCOLN & Co., Worcester, Mass.

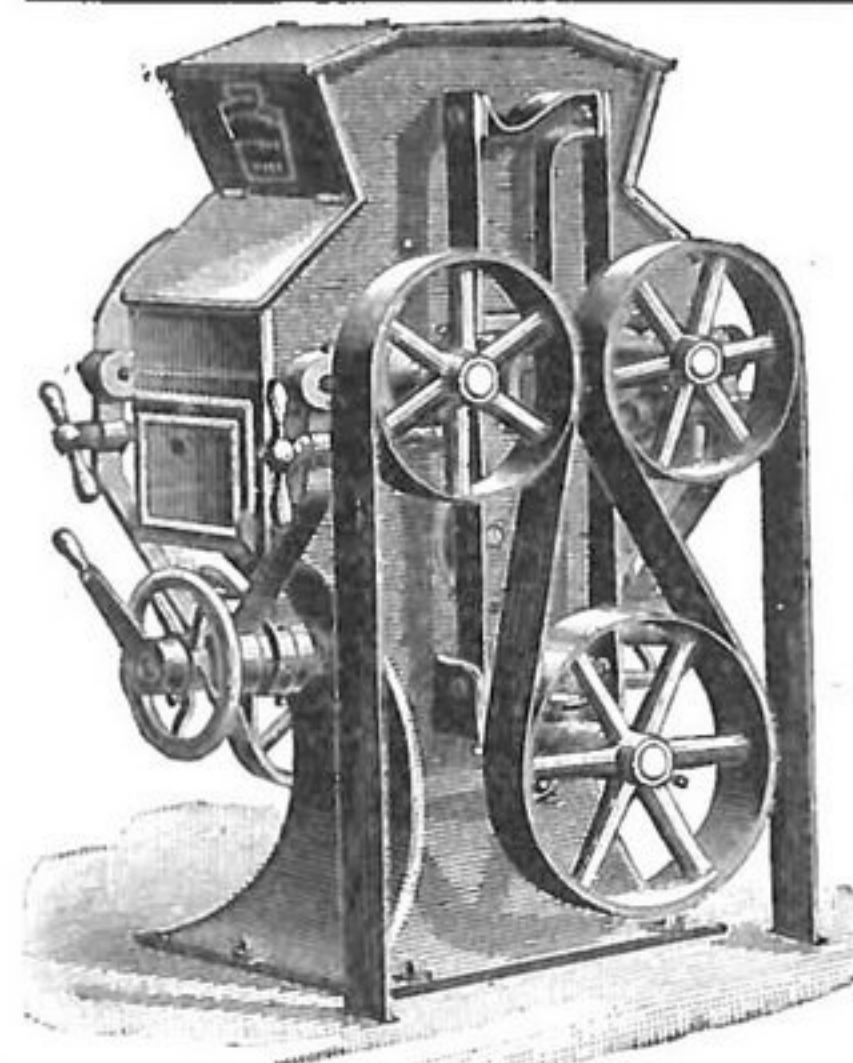
SEND FOR CATALOGUE—ILLUSTRATED AND DESCRIPTIVE.

## The Improved National Turbine Water Wheel

The Best for Economy; The Best for Durability; The Best for Power. ONE THOUSAND FIVE HUNDRED NATIONAL WATER WHEELS IN USE Prove that our Assertions are Supported by the Leading Manufacturers in the Country. Send for illustrated catalogue and prices to the manufacturers.



**The Case Wheel & Mill Co., Bristol, Conn.**



THE "KEYSTONE."

THE J. B. ALLFREE COMPANY, INDIANAPOLIS, IND.

NEW SHARON, IOWA, Feb. 10, 1890.

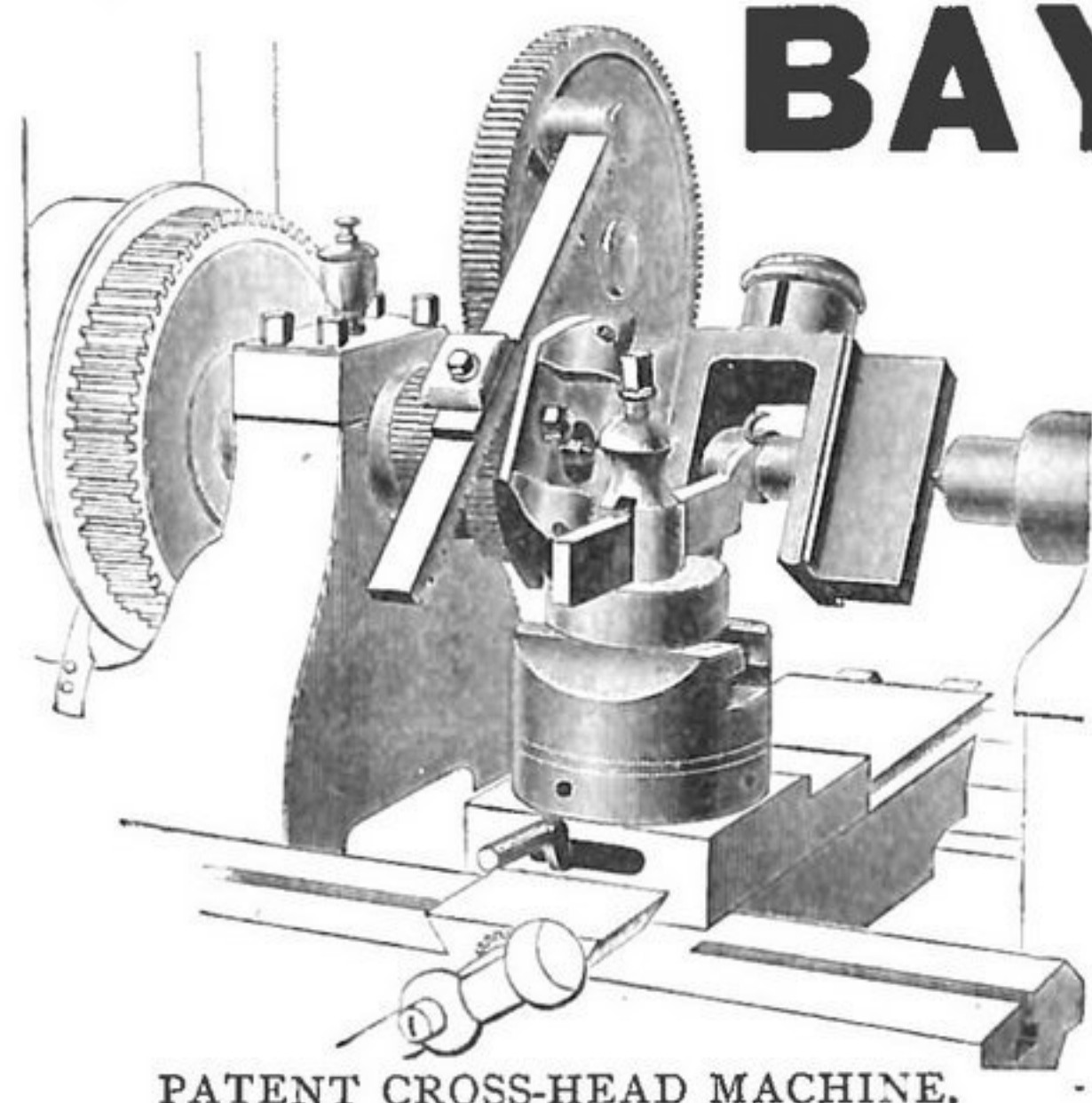
GENTLEMEN: We have had your mill in operation since November, 1889. It is an 80-barrel mill and put up in splendid style and finish. The *workmanship is perfect*, and in every respect, and all *our machinery runs with the greatest of ease*. Our engine is an "Allfree Automatic," and *it is a "daisy."* It *plays* all day long and takes *but little fuel*. *We would sooner have it than a Corliss*, and think it is *quite as economical*. Our entire mill outfit is first-class, and is made by *The J. B. Allfree Company, of Indianapolis, Ind.* The *shaker scalper* is a *success*, and *does better work than a reel scalper*, and runs easily with a 3-inch belt.

We wish all intending to build mills could pay us a visit, so that we could show them all the good points of our mill—for to see is to be convinced of its superiority. Our mill does good work, and we can say that we have had *no choke-up* and *no belt to change since we started*. We can *fully recommend the J. B. Allfree machinery* in every respect to millers wishing to build or remodel their mills.

Yours truly,

NEW SHARON MILL CO., R. D. HIGH, Manager.

**ADDRESS THE J. B. ALLFREE CO., 76 to 86 Shelby Street, INDIANAPOLIS, IND.**



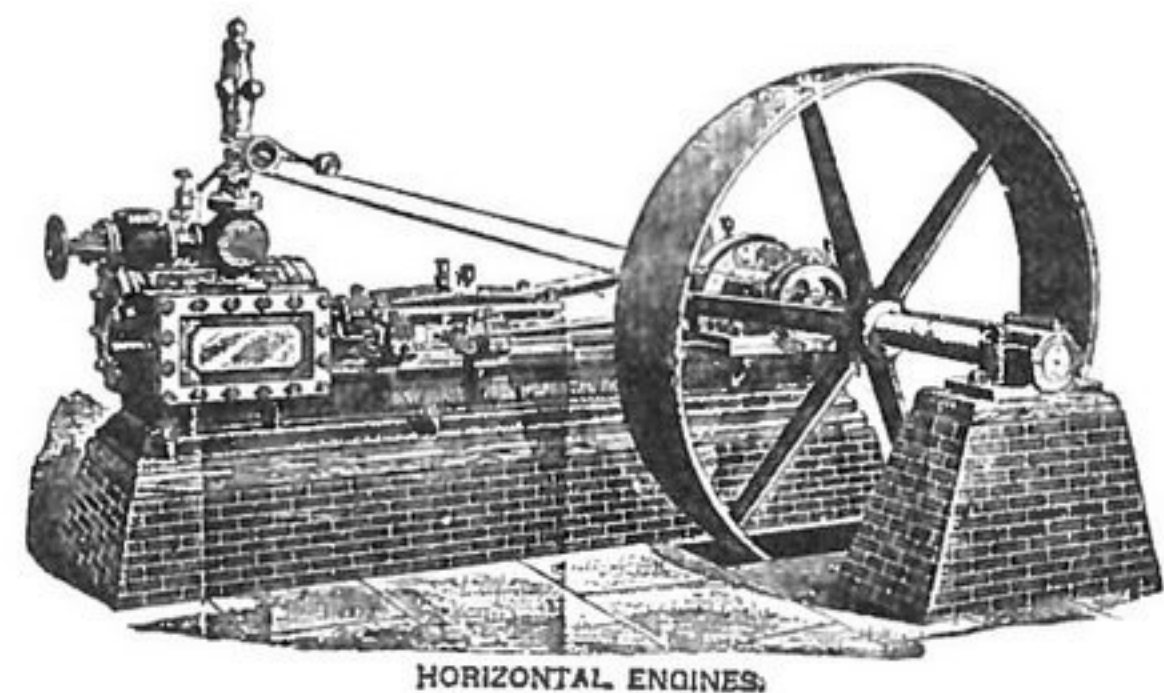
PATENT CROSS-HEAD MACHINE.

## BAY STATE IRON WORKS

— MANUFACTURERS OF —

## Engines, Boilers & Hoisting Machines

Also the Patent Cross-Head Machine and Acme Cube Pipe Tongs. We make either Center or Side Crank Engines, on same bed. Make engines from 5 to 250 Horse-Power. Have over 3,500 Engines and Boilers and over 1,000 Hoisting Machines in use, and all giving good satisfaction. Send for Catalogue and Prices.



HORIZONTAL ENGINES.

**Noble & Hall, Box 462, Erie, Pa.**



# OFFICE OF CASE MANUFACTURING COMP'Y COLUMBUS, OHIO.

## The Case Roller Mills. Over 14,000 Pairs in Use.

PLEASE READ OUR DESCRIPTION OF THEM, EVERY STATEMENT OF WHICH IS ABSOLUTELY TRUE.

PLEASE READ WHAT MILL OWNERS SAY ABOUT THEM.



The accompanying cut is a correct illustration of our latest improved Four Roller Mill. For fine work, great durability, simplicity, and general excellence, they stand "head and shoulders" above all others.

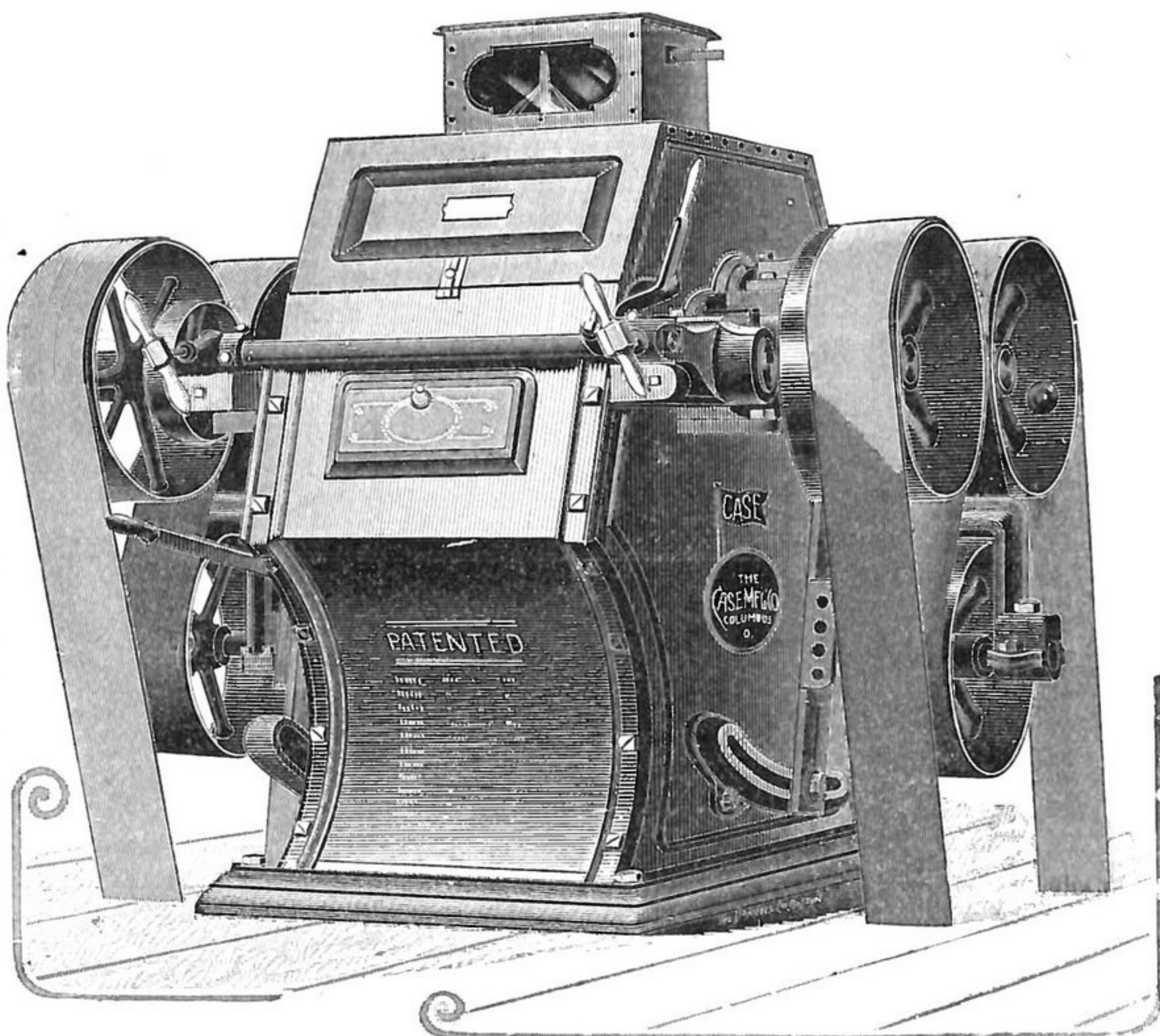
The frame is of iron with a heavy iron base.

The wood-work in top is of select cherry and black walnut, carefully shellacked and varnished.

The handles of adjusting screws and levers are finely nickel plated.

The joints are tight and dustless.

The adjustments easy, simple and perfect.



The roll bearings are wide and finely babbitted.

The belt drive is positive—no little short belts to slip.

The door for examining stock is a great convenience.

The arrangement for leveling rolls, simple and accurate.

The rolls can be thrown apart their entire length by one movement of the lever, and brought back again to original position, requiring no re-setting or experimenting.

Each machine is provided with our AUTOMATIC VIBRATING FEED, which requires no attention, and never fails to spread the feed the entire length of the rolls.



## Please Read These Testimonials.

LITCHFIELD MILLING CO., MANUFACTURERS OF FLOUR. }  
LITCHFIELD, ILL., Sept. 14, 1889.

Case Manufacturing Co., Columbus, Ohio.

GENTLEMEN: We are in receipt of your favor of the 11th inst., and in reply would say we have twenty CASE AUTOMATIC FEEDS on our Dawson and Allis Rolls, and we are greatly pleased with them. We have tested the Feeds thoroughly on different materials, and find they work as well on bran and germ and other soft materials, as they do on middlings. We have derived great benefit from the use of them, and can cheerfully recommend them to the milling fraternity.

Yours truly,

J. C. EDWARDS, General Manager.

OFFICE OF A. J. MILLER, PROPRIETOR WHITE ROSE MILLS. }  
DEALER IN FLOUR, GRAIN AND MILL FEED. }  
METAMORA, IND., Nov. 19, 1889.

Case Manufacturing Co., Columbus, Ohio.

GENTLEMEN: Your Feed arrived O. K., and placed it in working order in a very short time. You have furnished me a daisy Feed. After regulating your Feed, it needs no more attention. It pays for itself in one week over the "Roller Feed" in cleaning up the

stock, and also insuring the superiority at same time. I forward you the amount of bill.

Yours truly, A. J. MILLER.

TREZEVANT, TENN., Feb. 27, 1889.

The Case Manufacturing Co.

GENTLEMEN: We have five double stands of Rolls with Roller Feeds on all of them. A short time ago one of your agents induced us to try one of your Automatic Shaker Feeds. We find that it works much better than the Roll Feed, distributing the material the whole length of the Roll. We heartily recommend your feeds to any one wishing to put in new machinery.

Respectfully yours, FUQUA, HARRIS & CO.

W. C. MANSEFIELD & CO., MERCHANT MILLERS. }  
CLEVELAND, TENN., Aug. 29, 1889.

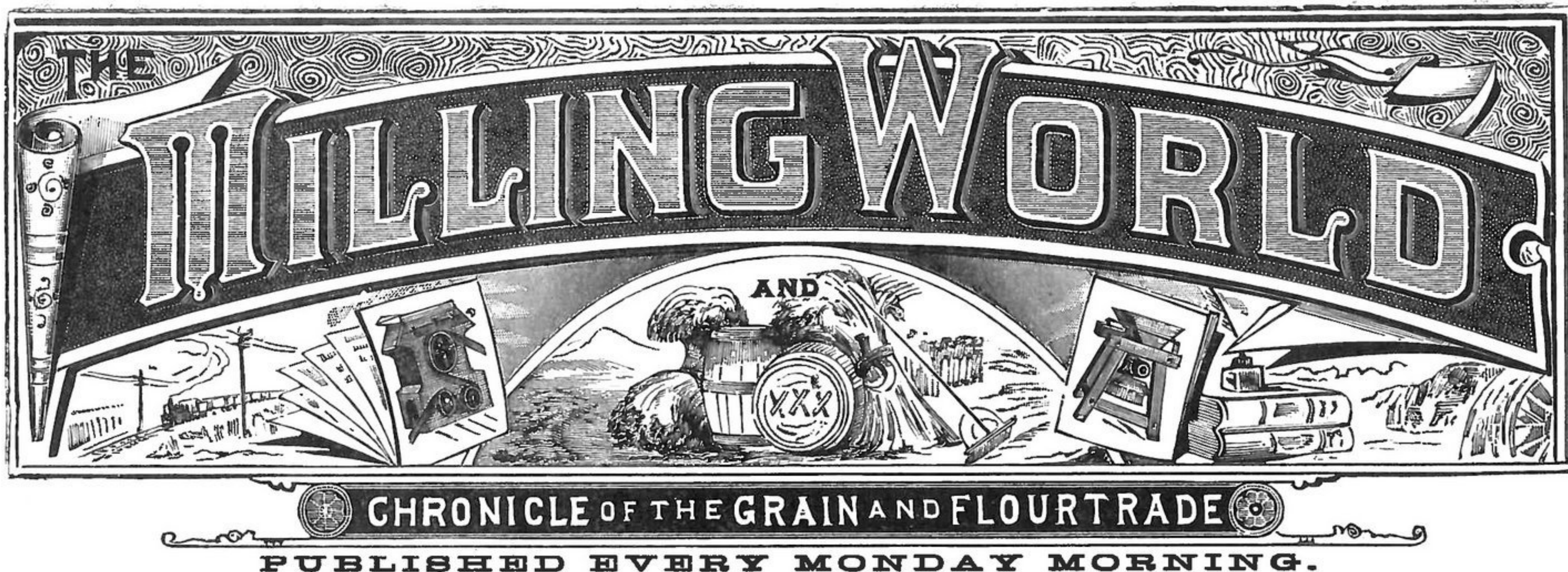
Case Mfg. Co., Columbus, O.

GENTLEMEN: If we were to build a hundred mills, we would not permit any other than the "CASE ROLL" to enter them. They are the best roll on earth.

Yours truly,

W. C. MANSEFIELD & CO.





VOL. XXII. No. 5.

BUFFALO, N. Y., MARCH 31, 1890.

\$1.50 PER YEAR.

THE consolidated Roller Mill Company rather grandiloquently and pompalaverously announced, not long ago, that they did not intend to fight their case in the newspapers, but in a "court of competent jurisdiction." Well, "competent jurisdiction" is a mighty good thing—for the millers—when exercised by Judges like Gresham and Blodgett.

No, Mr. Anxious Inquirer, there is no very pressing danger of a "roller-mill trust" in the United States. The season is unfavorable to a trust of that sort. There are too many good millers made to allow a trust or pool to be formed. Most of the patents on important improvements are too near expiration to make a pool possible. Public sentiment is against a trust. State and Federal laws are being framed to prevent and squelch trusts.

OUR esteemed Milwaukee cotemporary, referring to the roller-mill patent litigation, remarks: "The fight is getting interesting, and spectators ought not to interfere." Yes, that is very true, the first part of it, at least. The fight is interesting, very, very interesting. But why ought not the spectators interfere? Judges Gresham and Blodgett and the interested flour-makers are the spectators. How is the fight to come to an issue unless they participate actively? When the sharks they will a-courting go, they must stand the concomitant racket whether they like it or no.

ACCORDING to the announcement made by Secretary D. H. Ranck, of the Indiana Millers' Association, there will be an important meeting of flour-makers in Fort Wayne, Ind., on Tuesday, May 13. The millers of Indiana, Ohio and Michigan will then and there convene, and they will deliberate upon the condition and needs of the great industry. Let every miller, who can, attend the meeting. The only thing that seems to cloud the prospect of the convention is the threatened "co-operation" of the Millers' National Association. Generally, when the "National" comes in at the door the millers fly out at the windows. It is to be hoped that the Ohio, Michigan and Indiana millers will hold the reins themselves and not allow the "National" to hippodrome their convention into a mere side-show.

It is discouraging to note that the figures of immigration do not continue to show the hoped-for decrease. The month of February brought to the United States 16,973 home-seekers, against 13,316 in February of last year. The first two months of this year brought 28,271, against 23,588 last year. The 8 months ending with February, this year, brought 218,653, against 225,906 a year ago, a decrease of only 7,253. This is not encouraging. It was hoped that the current fiscal year would reduce immigration into the United States to 200,000 or less, but already that figure is surpassed, and we have yet four months in which to see the figures swelled. Of the 218,653 immigrants coming into the United States in the past 8 months, Austria-Hungary, exclusive of Poland, sent 29,063, against 18,297 a year ago; Denmark sent 3,554, against 3,484; France 4,361, against 4,103; Germany 48,742, against 52,760;

Great Britain 63,605, against 79,994; Italy 18,015, against 11,590; Russia 18,516, against 18,094; Sweden and Norway 17,116, against 23,308. Is the tide never to turn?

It is coming at last. Measures are definitely proposed to place the American railroad carrying business on an equality, at least, with the Canadian railroad competitive business. The Fool Interstate Commerce law has aided the Canadian Pacific and the Grand Trunk at the expense of the American lines, and at last it is proposed to bring the Canadian lines strictly under the rule of the American law, or else to shut them out totally from participation in the American traffic. It is highly probable that the bonding privileges extended to the Canadian Pacific between San Francisco and Port Moody will be rescinded, as they are plainly illegal and inexpedient. Our Canadian neighbors have been cackling over the predicament in which the American lines have been placed, and they have pooh-poohed the prophecy that there would be a smash some day. That smash is coming, and the Canadian lines may as well prepare either to come under the American law or to stay out of the American preserves. Either horn of the dilemma will prick the bubble of Canadian exultation.

EVERY irresponsible scribbler, every writer of imbecile "grain circulars," every grain gambler, every editor of journals that pretend to do what they do not and can not do, attacks the crop statistics of Statistician Dodge of the Agricultural Bureau. More thoroughly attacked figures it would be impossible to find. Statistician Dodge is not explicit enough to suit the editors who guess at supplies and publish their guesses as the alleged results of pretended investigations. He is not successful in making the totals of his figures, gathered from all available sources, agree with the totals of the grain-circular imbeciles, which have no foundation on any information from any conceivable source. He systematically fails to reach conclusions that agree with the sapient conclusions of the groggy bummers who scribble for the sensational grain-gambling dailies. He is too "bear" for the "bulls." He is too "bull" for the "bears." The bumptious editors, guessers, gamblers and scribblers, with no information at hand, attack his work, which represents real information gathered from various points. Beyond doubt this unanimous attack, by all these interested men, is the best evidence of the real value of Statistician Dodge's reports. The fact that he displeases them all shows that he favors no class, caters to no one interest, and goes on his way exactly as he should go, paying no attention to the imbeciles, the gamblers, the scribblers and the bumptious pretenders. To-day the only "reports" in the United States on grain crops, conditions and movements worth a moment's attention are those sent out by Statistician Dodge. Even his critics gauge their "estimates" by his totals, the bear guessers increasing them, and the bull guessers decreasing them, according to the influence they wish to exercise for the time upon the markets. The Dodge reports are the only ones that represent real information. All the others are fraudulent guess-work.



# The DAWSON ROLL WORKS CO. FOUNDERS & MACHINISTS,

—MANUFACTURERS OF THE—

## Dawson Roller Mills

—AND FURNISHERS OF—

### CHILLED IRON ROLLS

WITH DAWSON PATENT CORRUGATION.

ALL STYLES OF FLOUR MILL ROLLS RE-GROUND AND  
RE-CORRUGATED WITH ANY FORM OF CORRUGATION.

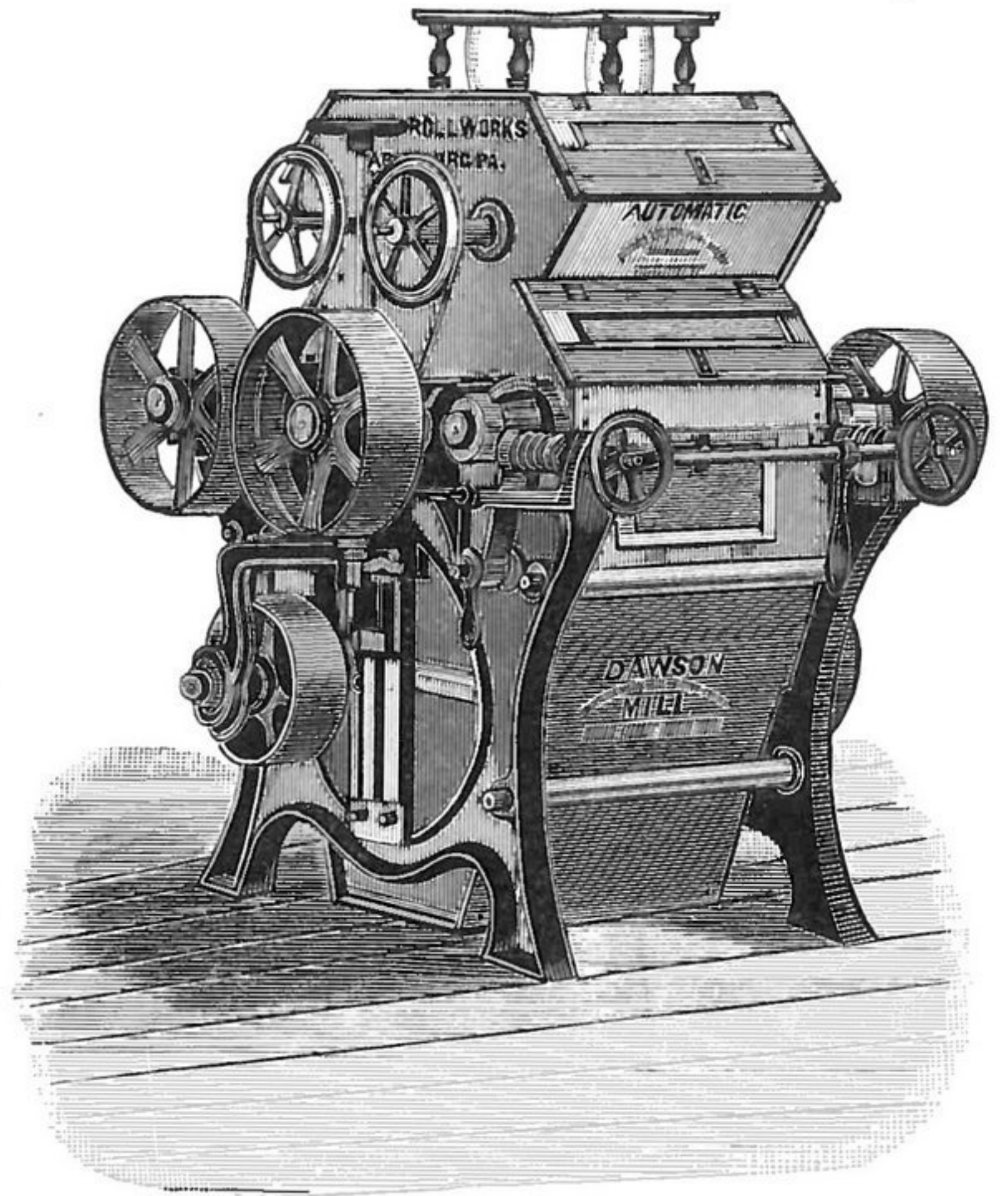
We have had large and extended experience in grinding and corrugating chilled rolls for milling, and have one of the largest and most improved plants in the country for this work, which enables us to meet the most exacting requirements of the trade promptly.

ORDERS AND CORRESPONDENCE SOLICITED.

## DAWSON ROLL WORKS CO.

South and Short Streets,

HARRISBURG, PA.



## The Cowles "Reliable" Sectional Wood Pulley

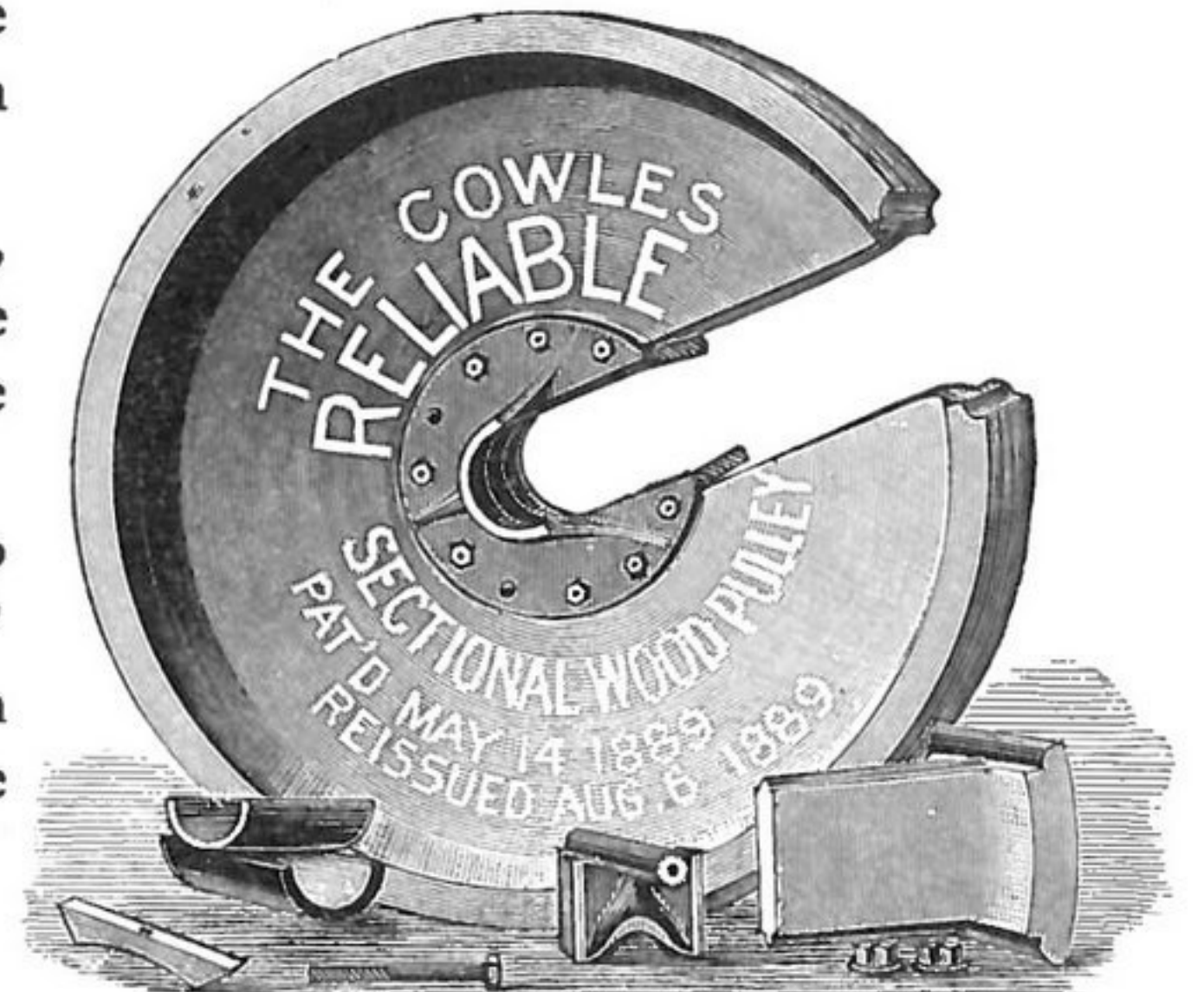
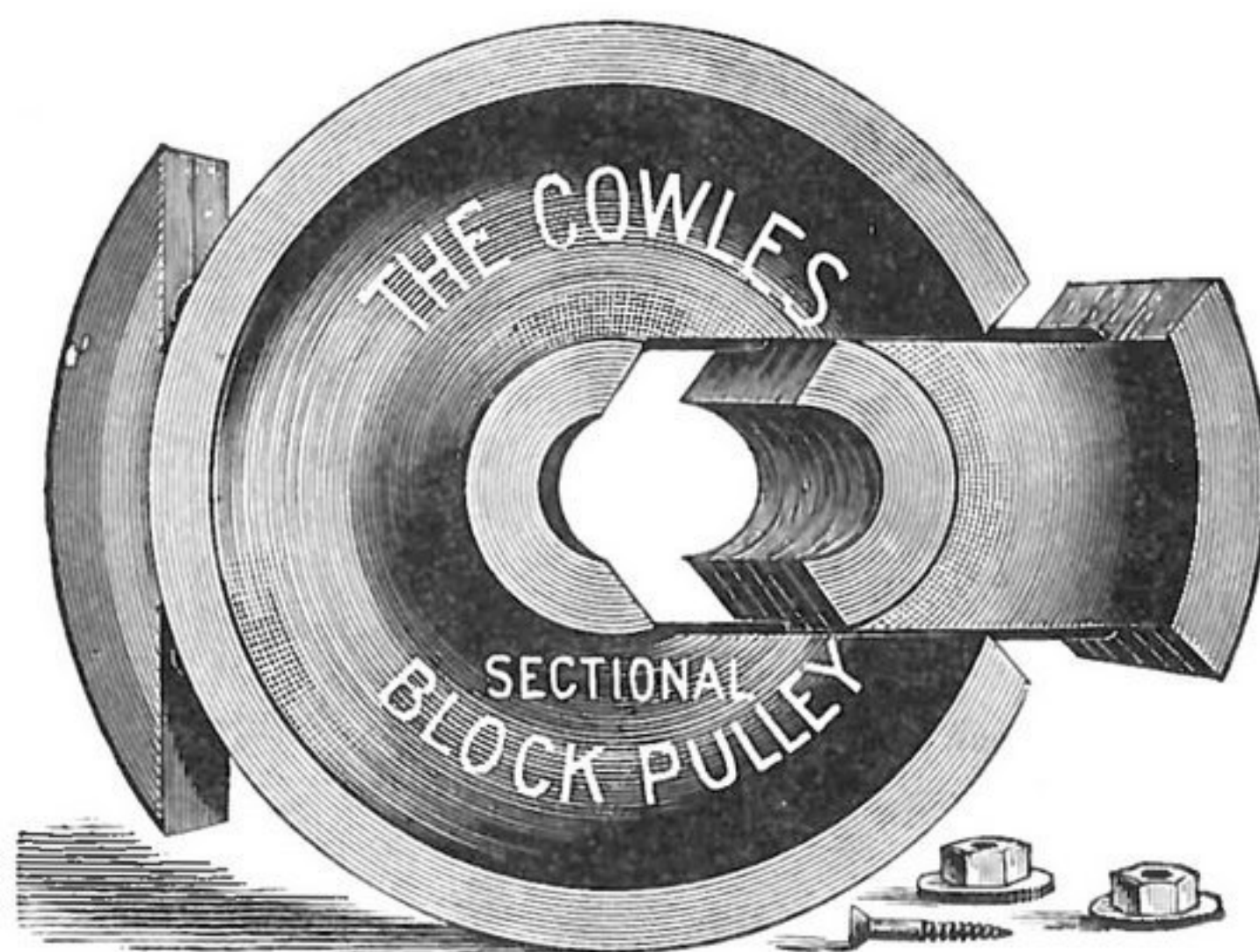


Web made of several layers glued together with grain crossing, and faced up on both sides. Iron flanges securely bolted to web. Rim put on after web has been trued up. Web and rim turned on inside and face, making perfect running pulley. Rim supported entire circumference. Positive self-gripping device for securing pulley to shafting, which is self-centering, and can not slip with wear.

A wooden rim pulley transmits from 30 to 50 per cent. more power with same belt than an iron one.

Two-thirds lighter than iron, bearings will wear longer and the expense for lubricant will be less.

Having solid web, there is no air resistance. The "Reliable" can be placed on shaft or position changed in one-fourth the time required with any other pulley.



EDWARD GERMAIN, SOLE MANUFACTURER SAGINAW, MICH., U.S.A.





PUBLISHED EVERY MONDAY. OFFICES: { Corner Pearl and Seneca Streets,  
Over Bank of Attica.  
McFAUL & NOLAN, - - - PROPRIETORS.  
THOMAS MC FAUL. JAMES NOLAN.

**SUBSCRIPTION.**

In the United States and Canada, postage prepaid, \$1.50 Per Year, in advance; remit by Postal Order, Registered Letter, or New York Exchange. Currency in unregistered letter at sender's risk.  
To all Foreign Countries embraced in the General Postal Union, \$2.25 Per Year, in advance.  
Subscribers can have the mailing address of their paper changed as often as they desire. Send both old and new addresses. Those who fail to receive their papers promptly will please notify at once.

**ADVERTISING.**

Rates for ordinary advertising made known on application.  
Advertisements of Mills for Sale or to Rent; Partners, Help or Situation Wanted, or of a similar character One cent per word each insertion, or where four consecutive insertions are ordered at once, the charge will be Three cents per word. No advertisement taken for less than 25 cents. Cash must accompany all orders for advertisements of this class.  
Orders for new advertisements should reach this office on Friday morning to insure immediate insertion. Changes for current advertisements should be sent so as to reach this office on Saturday morning.

**EDITOR'S ANNOUNCEMENTS.**

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.  
Correspondents must give their full name and address, not necessarily for publication, but as a guarantee of good faith.  
This paper has no connection with a millfurnishing house and aims to represent the trade without prejudice, fear or favor.  
Address all communications

**THE MILLING WORLD,**  
BUFFALO, N. Y.

Entered at the Post Office, at Buffalo, N. Y., as mail matter of second-class.

**SITUATIONS WANTED.**

Advertisements under this head, 25 cents each insertion for 25 words, and 1 cent for each additional word. Cash with order. Four consecutive insertions will be given for the price of three.

**SITUATION WANTED.**

Head miller with over 20 years experience want to make a change this spring. Address, A. MILLER, 67 Weaver Alley Buffalo, N. Y. Ad-4t

**WANTED.**

A situation to run a 50 to 100-barrel roller mill. Pennsylvania, New York, Ohio and Michigan preferred. Address MILLER, Box 75, Union City, Erie Co., Pa. 86

**WANTED.**

A situation in some flouring or grist mill, by a man who has had good experience with the buhr system. Can furnish best of references. Address, THOMAS H. NICHOLAS, DeRuyter, N. Y. 14

**SITUATION WANTED.**

A situation wanted by a stone and roller miller, 14 years' experience, to take charge of custom mill, or work as second in first-class roller mill. Address WILLIAM H. EATON, North Ridgeway, Orleans County, N. Y. 8

**SPECIAL ADVERTISEMENTS.**

Advertisements of Mills for Sale or Rent, Partners Wanted, Machines for Sale or Exchange, etc., etc., cost 1 cent per word, for one insertion, or 3 cents per word for four insertions. No order taken for less than 25 cents for one insertion, or 50 cents for four insertions. Cash must accompany the order. When replies are ordered sent care of this office 10 cents must be added to pay postage.

**WANTED.**

The address of Mr. Buhr Miller who was formerly a citizen of Prosperity removed to Adversity, and when last heard from was in Despondency looking for a job. By the will of his uncle Oliver he becomes heir to a modest fortune to obtain which he should address the FLENNIKEN TURBINE COMPANY, Dubuque, Iowa. Administrator.  
(Exchanges please copy)

**MILL MACHINERY FOR SALE.**

One No. 0 Standard Combined Separator, Smutter and Brush Machine; new, best make.  
One 20-Inch Under-Runner Portable Mill, French Buhr Stone, capacity 10 to 12 bushels per hour; new, best make.  
One 14-Inch Vertical Feed Mill; best make, new, a bargain.  
One No. 6 Dustless Separator; new, a bargain.  
One No. 1 Full Rigged Combined Dustless Separator; new, a bargain.  
Four Corn Cob Crushers, right or left hand, driven from above or below, best make; capacity 40 to 60 bushels per hour.  
Three No. 1 Corn Shellers, capacity 200 to 300 bushels per hour; new.  
One No. 2 Purifier. New. Best make. A bargain.  
One 20-Inch Portable Mill.  
One 18-Inch Double Gear Portable Mill.  
For particulars address, FRANK SMITH, care of THE MILLING WORLD, Buffalo, N. Y. 5tf

**FOR SALE CHEAP.**

One 36-In. Iron Frame Portable Mill, French Burr Stone, Used about 2 months.  
One 20-In. Vertical Mill, French Burr Stone, Used about 30 days.  
Three Pair 42-In. Old Stock Feed Stones.

FOR PARTICULARS ADDRESS,

**SAMUEL CAREY, 17 BROADWAY, NEW YORK.**

**FOR RENT.**

Clinton Mills, at Black Rock, Buffalo, for rent on reasonable terms, recently repaired and put in good order. Apply to CHAS. DANIELS, over 311 Main Street, Buffalo, N. Y. 6tf

**FOR SALE.**

One-Hundred Barrel Roller Mill, in one of the best winter wheat sections of the country. Wheat brought to the door in wagons, and flour can be shipped in any direction by six railroads and river. Splendid home market, here and in Louisville.  
Also a Sixty-Barrel Custom Mill, roller, running full time on custom, and can hardly keep up. Paying well now, but satisfactory reason for selling. Either or both will be sold cheap. J. M. HAINS, New Albany, Ind. 263

READ the new advertisement of the Buffalo Specialty Manufacturing Company, of Buffalo, N. Y., which appears in this issue. Read what they have to say about their "Electric" belt-dressing, and address them for information and prices.

STERN truth comes to the front sooner or later. During the past three months we have read much about the "great wheat crop," the "gigantic surplus of wheat," the "superior quality" of the Argentine Republic wheat crop now coming into market. This great and limitless South American crop was to yield enough to swamp the markets of the world and flatten out the wheat industries of the United States. That was the prophecy. Now comes the realization of the truth. The Argentine crop is gathered. In March the most hopeful estimate of the surplus for exportation was 7,000,000 bushels! And that is what the bear boomers call a "gigantic crop of wheat!"

ONE Chicago grain speculator, doubtless on the bear side of the fence, is to the front with a general denial of all the reports of damage to the winter wheat by the March cold snaps, and also with a bet that the wheat crop of the United States in 1890 will be 520,000,000 bushels, autosalvationally adding "if the season turns out favorable from now on till harvest." He might bet the same way, adding "if the harvest turns out that quantity." That would be quite as reasonable a proposition as the one he really makes. Meanwhile, there is no doubt that much damage has been done. Letters from farmers, and from men who have no interest in ruined crops, are filled with stories of damage beyond repair. It looks at this date as though the situation should encourage large spring-wheat sowings this year.

IN another place appears an announcement by the secretary of the Millers' National Association concerning the annual convention to be held June 17th to 20th next. The meeting is declared to be an important one, as the association is to be "reorganized" and a new constitution adopted. That reorganization and a new constitution are sadly needed can hardly be doubted, but it is surely open to question whether the proposed constitution will most help or hurt the association. Giving barrels of flours precedence over men will throw all the power in the association into the hands of a few men, and reorganization will not help the association so long as those few men rule it. The convention will give many millers an opportunity for seeing the milling town, Minneapolis, and the low railroad fares may do much towards calling together a considerable number of visitors.

It is loosely asserted that milling in the United States is centralizing in large towns, and that the mill-furnishing business is settling into the hands of a few houses. There is not a spark of truth in either of the assertions. There was never a time when more small and medium mills were building in this country than now. There never was a time when the "milling centers" had more trouble to sustain themselves than now. There never was a time when the mill-furnishing business was more scattered than now. The writers, who murder spring-wheat with December and January cold snaps and midwinter chinch-bugs and Hessian flies, of course do not need the "facts" when they write about mill building and furnishing, as the solid facts would destroy the picturesque sensationalism of their irresponsible scribbling. The small millers are increasing in number, and the admirable short-system modern-process plants prepared for them by the medium building and furnishing houses make them able to stand against any effort at centralization that may be made.



## ON BOILER TRIALS.

*"The Locomotive."*

Although most engineers understand the principles of boiler testing, we have thought that an outline of the methods most commonly used might be of service to such readers as have never conducted or been present at such trials. The apparatus in the cuts is simple and can readily be set up and arranged by any engineer. The first thing to do, in making the trial, is to set up the pump, C (Fig. 1), and the cask, A, and scales, B. In case the boiler to be tested (D) is one of a battery, its feed-pipe, E, may be disconnected from the main feed, F, the opening thus left in the tee on F being closed by a screw-plug. The boiler-feed is then connected to the pump by means of suitable pipes, reducing coupling being used if necessary. The suction of the pump is connected to the cask, A, by means of a rubber hose, H, and the cask is filled by means of another piece of hose, shown at K. The connection at E should be left until the last thing, or otherwise the water in the boiler may run low while the pump and cask are being arranged, and serious damage may result.

When all is in readiness, a small quantity of water is let into the cask, and the pump is started so as to fill the connecting-pipes and enable the engineer to detect and stop any leakage there may be. The fire is then hauled, and the water-level is marked. The mark should be a little above the second try-cock, this being the general level carried by

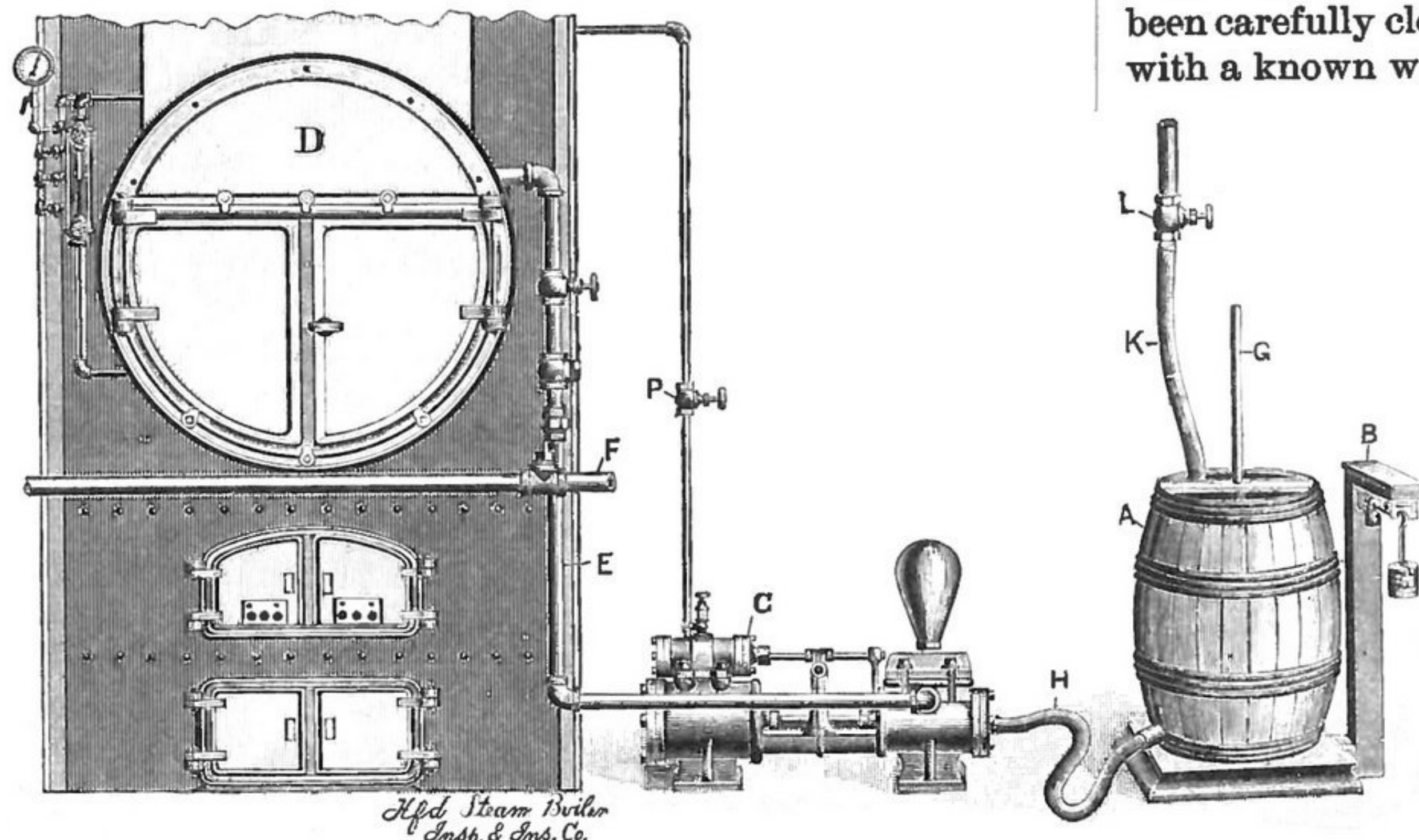


FIG. 1.—APPARATUS FOR EVAPORATING TEST.

engineers. A new fire is next built on the grates, using kindling material that has been previously weighed. Meanwhile water is introduced into the cask until the cask and its contents weigh 600 pounds. When it becomes necessary to feed, the temperature of the water in A is taken by stirring a thermometer around in it, and the valve P is opened and the pump allowed to work until the cask and its contents weigh exactly 100 pounds. We know, then, that 500 pounds of water have been introduced into the boiler. This fact, together with the time of day, is taken down in a note-book, and the cask is filled once more ready for the next feed.

In order to avoid errors in getting the weight of the feed water, it is well to proceed as follows: Place a float in the cask, with a rod or stick, G, projecting upward from it, and passing through a hole in a piece of board tacked to the top of the cask. Place the sliding-weight of the scales [at the zero mark, and at the end of the beam hang two 200-pound weights and two 100-pound ones. Then open the valve L and let the water enter the cask until the scales just balance. If a slight excess of water is introduced, it may be baled out, so as to make the balance exact. Then make a mark on the float-stick, G, opposite the top of the board through which it passes. Then take off all the weights at the end of the beam, except one of the 100-pound ones, and pump down till the scales just balance. Then make another mark on G, opposite the top of the board on the cask. After this has been done, the procedure is very simple. To fill the cask, add the weights that have just been removed, and open the valve L wide until the high-water mark on G gets near the

top of the board. Then shut it almost off and let the cask fill slowly until the scales just balance. A little practice will enable the engineer to shut off the water so exactly that the beam of the scales will come to rest half way between the stops; but should too much water be accidentally admitted, the sliding-weight on the beam is run out till the balance is restored, and the correct weight of the water is jotted down in the note-book. The sliding-weight is then pushed back, and all weights except the 100-pound one are removed from the beam. When the water is fed the valve P may be opened up till the low-water mark on G approaches the board, the pump being then run slowly until the balance is obtained. If P is not closed quickly enough, so that a little too much water is removed from the cask, the 100-pound weight on the beam is removed and the true weight of the cask and contents ascertained by means of the sliding-weight.

As the trial draws to a close, care should be taken that the water-level in the boiler is a trifle below the string on the gauge-glass, which marks the level of the water when the test began. Then, when the trial is at an end and the fires have been drawn, water is introduced by the pump until the level is brought back to the string, and the weight of the water so introduced is recorded in the note-book. It will then be an easy thing for the engineer to find out, at his leisure, precisely how much water he has fed during the entire trial.

Now as to the fires. When the grates and ash-pit have been carefully cleaned, and the new fire has been started, with a known weight of kindling material, a careful record should be kept of the weight of coal used, and the condition of the coal should be

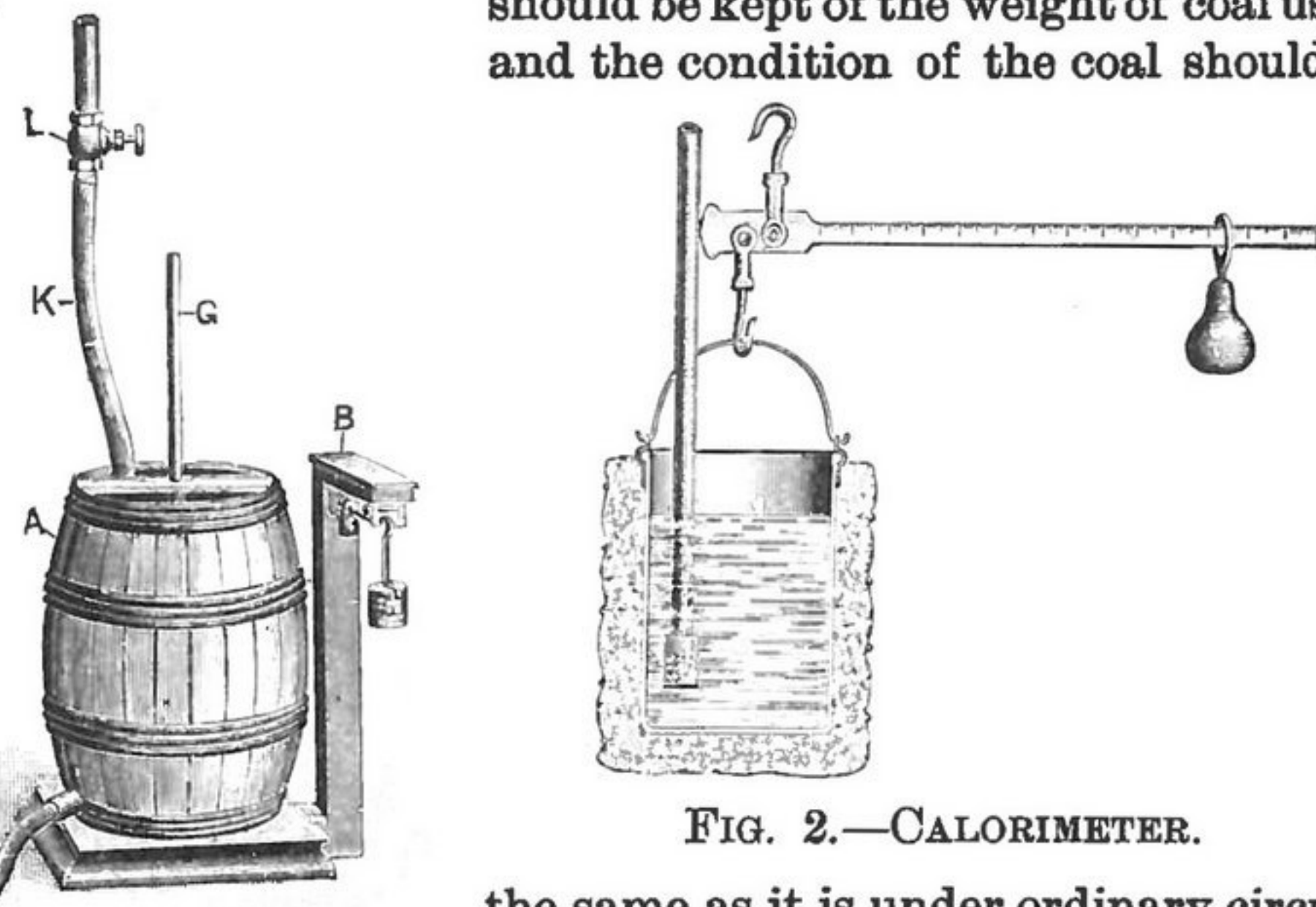


FIG. 2.—CALORIMETER.

the same as it is under ordinary circumstances in every-day practice. Many engineers, in making such trials, dry out a sample of the coal to find out what proportion of it is moisture, and allow for this moisture in the total weight of coal used. This does not seem to us a desirable thing to do, since the object of most tests is to find out, not what the boiler can do under assumed conditions, but what it does do under actual conditions. The same rule applies to the handling of the fire. We hold that if the trial is intended to show what the boiler is doing in its every-day work, no attempt at expert firing should be made while the trial is in progress, but everything should be done as on ordinary days.

No water should be used in the ash-pit, and as the end of the test draws near it is a good plan to let the coal on the grate burn pretty well out. At the last moment the fire is hauled and deposited in the ash-pit, together with the ashes already there, and allowed to cool, when the coal may be separated from the ash and clinker by hand, if desired. Both are then weighed, and the sum of the two is taken from the total weight of coal fed into the furnace. This gives the quantity of combustible used. If the coal found in the ash-pit be subtracted from the total amount of coal used, the result is the total amount of coal used. If the weight of ash be divided by the weight of coal used, the result is the per cent. of ash the coal contains.

If the steam that the boilers gave off was perfectly dry, the weight of water fed would be equal to the weight of steam formed; but since steam ordinarily contains a certain percentage of water, existing in it in the form of fine spray, or mist, we have to take this fact into account in estimating the quantity of water evaporated. The apparatus for de-



termining the moisture present in steam is shown in Fig. 2. It consists of a common steelyards and a large tin pail, about which a layer of cotton wool,  $1\frac{1}{2}$  or 2 inches thick, is wound and secured by means of an outer layer of cloth, around which several turns of string are tightly wound. The empty pail is made to weigh some exact number of pounds by placing one or two nuts or other bits of iron in it. Ten pounds of water are next weighed into it, and the weight on the steelyards is then pushed along one pound. Steam is then blown into the pail until the steelyards once more balance. In this way we know, with considerable precision, just when one pound of steam has been added to the water. The temperature of the water in the pail is taken both immediately before and immediately after the steam has been passed into it, care being taken, especially in measuring the higher temperature, to stir the water well with the thermometer, and to leave the thermometer in it long enough for the quicksilver to reach the same temperature as the water in which it is plunged. The rise in temperature so obtained gives a means of determining the percentage of moisture in the steam.

We think that most engineers will find the following table very satisfactory. The first table of this sort, we believe, was given about 1867 by Dr. Van der Weyde. It has since been republished by Mr. Thomas Pray and others. This table is exact when the steam pressure is 75 pounds and the temperature of the water in the pail, before drawing steam into it, is  $60^{\circ}$ . It will still be serviceable, however, for pressures and temperatures differing considerably from these. If the rise in temperature is greater than  $105^{\circ}$ , the steam is superheated. It will be seen that the thermometer used in this work must be of very good quality, in order to give readings of sufficient accuracy to determine the moisture satisfactorily. It should be graduated to single degrees, and the readings, both before and after drawing the steam, must be taken with great care. The experiment should be repeated frequently during the trial, and the average rise in temperature is to be taken in calculating the moisture from the table given below:

TABLE FOR FINDING THE PERCENTAGE OF MOISTURE IN STEAM.

Rise in Temperature.	Per Ct. of Water.	Rise in Temperature.	Per Ct. of Water.	Rise in Temperature.	Per Ct. of Water.
105 Deg.	0	95 Deg.	12	77 Deg.	34
104 "	1	93 "	14	76 "	36
103 "	2	92 "	16	74 "	38
102 "	3	90 "	18	72 "	40
101 $\frac{1}{2}$ "	4	88 $\frac{1}{2}$ "	20	71 "	42
101 "	5	87 "	22	69 "	44
100 "	6	85 "	24	67 "	46
99 "	7	83 "	26	66 "	48
98 "	8	81 "	28	64 "	50
97 "	9	80 "	30	62 $\frac{1}{2}$ "	52
96 $\frac{1}{2}$ "	10	79 "	32	61 "	54

Particular attention should be paid, in making boiler trials, to two points. In the first place, the blow-off valve must be perfectly tight. Otherwise a considerable amount of water will pass off through it, and the boiler will appear to be doing better than it really is. Secondly, in drawing steam from the main pipe for use in the calorimeter, care must be taken to let it blow freely through the pipe running to the pail, until this pipe and its connections are well heated; otherwise the steam will appear wetter than it really is. The lower end of this pipe should be fitted with a rose, or at all events with a tee, so that the incoming steam may not blow directly against the bottom of the pail. If this is not attended to, the engineer will find it impossible to tell when he has drawn off precisely one pound of steam. Attention should be paid, also, to the manner in which this pipe enters the main. More or less moisture is always drawn along the interior surface of steam-pipes by the steam, so that, if the pipe barely enters the main, the steam drawn off through it will be too wet and will not fairly represent the average quality of that which the boiler is making.

The percentage of moisture in the steam being known, the quantity of water that went over into the mains as water is easily found. Thus, if the total water apparently evaporated

was 15,000 pounds, and there was 5 per cent. of moisture in the steam, the total amount that went over unevaporated would be  $15,000 \times .05 = 750$  pounds. This being subtracted from the weight of water fed, we have  $15,000 - 750 = 14,250$  pounds as the quantity of water actually evaporated. If this be divided by the total weight of coal burned (say 1,750 pounds), the evaporation per pound of coal is  $14,250 \div 1,750 = 8.14$  pounds.

#### POINTS IN MILLING.

THE second-hand-machinery-just-as-good-as-new-and-only-half-as-expensive idea dies hard. It seems to have twice as many lives as the old singed-back, stub-tailed, clawless, blear-eyed and lazy mill-cat. The trouble with millers, as it is with all other men, lies in the fact that no one man can really learn wisdom from the mistakes made by any other man. One miller may know that his neighbor has failed in business because he used second-hand or inferior machinery, but that knowledge will rarely keep him from making the same mistake.

A SIMPLE calculation ought to be enough to convince the stupidest miller in the land that second-hand machinery can not by any manner of means, serve him so well as a new machine. Look at the matter for a moment. A roller-mill, for example, is capable of doing a certain number of days of good work. Let that number be 2,000 days, for example. Now the first day of work done leaves 1,999 days in that machine, and every succeeding day shortens its working life. At the end of 500 days it can possess only 1,500 days of working life. Something happens, and the owner throws it out. It is advertised to be "as good as new," when it really is not "as good as new" by at least 25 per cent.

THE man who is tempted to purchase it should look well to its age. One most important thing he should not forget, and that is this: After the first 500 days of work have been taken out of a machine, under ordinary circumstances the second 500 days of work will be far less satisfactory than the first, and the third 500 days will be still less satisfactory. When it comes to the last 500 days in the work of a 2,000-day machine, the owner will find it impossible to get any satisfaction at all out of it. It will perform like a bald, toothless, stiff-joint old man attempting the feats of the youthful gymnast.

A MACHINE will work better and better up to a certain point of perfection, and after that point is reached deterioration inevitably follows. As soon as the deterioration shows in the bad quality of the work done, that machine has one foot on the scrap-heap, or both feet in the second-hand market, and the purchaser should look well to the possible consequences of buying any machine that has become bad enough to make its owner or operator desire a better one.

THE same objections that apply to the second-hand machine apply with equal force to the bad or inferior machine. A good machine, made by a reliable firm, on approved designs, of the best material and in the most careful manner in all details, should command a better price than its opposite, and the miller who chooses the poor one, or who "jews down" the price of the good one to the level of the poor one, is making a mistake. He is putting a premium on bad machinery which it does not deserve, and he is keeping from the careful maker, instead of giving to him, the difference between the cost of a good machine and that of a bad one.

It is discouraging to the builder of superior machines to be forced, through competition, to sell his work on a level with inferior work. I take it that millers themselves are more harmed than helped by the fierce competition over machinery in these days. It stands to reason that low prices for good machines mean poorer machines in the future. Makers must make money as well as machinery. They are entitled to fair recompense on their investment and their skill, on their patented inventions and their experience. If they are to be compelled to throw all these into the pool,



and if they are allowed to take out no more profit than the makers who have no meritorious wares take out, there will be no inducement for them to work for the improvement of the trade.

If the second-hand machines are really "just as good as new," and if inferior machines are really as valuable as superior machines, the mill-furnishing problem has at last been solved. Does any reasonable miller believe the two propositions?

#### HIGH-CLASS HORIZONTAL ENGINES.

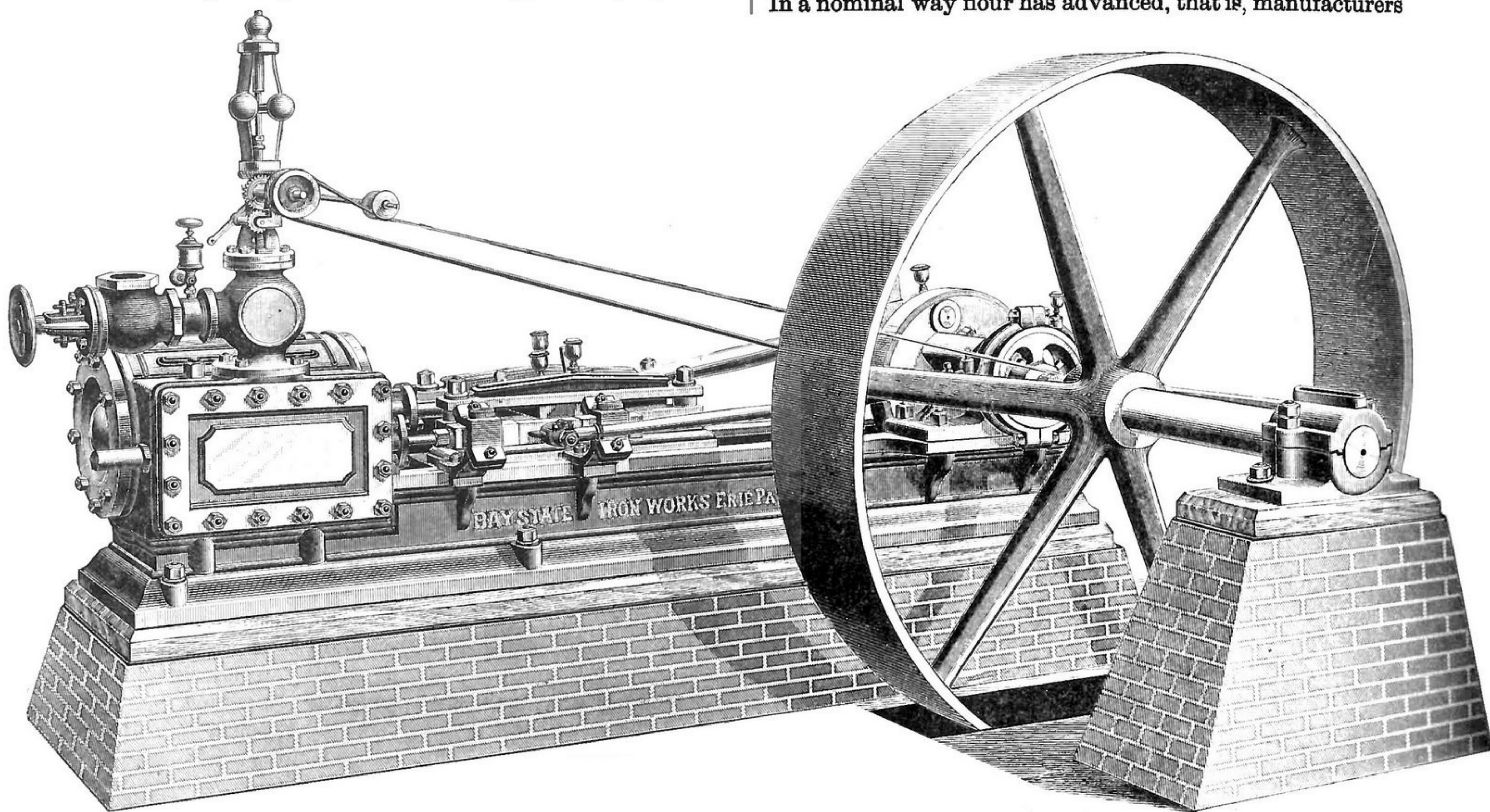
Herewith is an engraving illustrating the superior horizontal engines manufactured by the Bay State Iron Works, Messrs. Noble and Hall proprietors, Erie, Pa. The engine shown is a 14x18 inches engine. All the other sizes are made in the same style. They make them ranging from 5 to 250 horse-power, making a specialty of the larger sizes. These engines are very heavy and well made and, consequently, very durable. The engine-bed is very thick. The cylinder is nicely lagged, which prevents radiation. The cylinder heads have ground joints. The piston has the best steam packing. The valve-rod is supported by a pocket.

trices are truss shaped, so they can not spring. The balance pulleys have straight arms and thick rims. The steam-chest cover has wide packing surface and plenty of steel bolts, so that the packing never blows out. With these engines are included throttle-valve, governor, oil-cups and drain-cocks, and with the larger sizes, 16x24 inches and upwards, the best automatic stop governors, sight-feed lubricators, automatic wrist-pin oilers and the best oil-cups. They also furnish heaters and injectors when desired. Send for catalogues and prices to Noble and Hall, Box 462, Erie, Pa.

#### COTEMPORARY COMMENT.

Seeding is now being speculated upon. At this time last year quite a quantity of wheat had been sown in Manitoba, while this year the land is still covered with a depth of a foot or more of snow and the thermometer is going away below zero daily. At present there is not much prospect that seeding will commence inside of some weeks. —Winnipeg "Commercial."

One thing that surprises millers more than anything else is that flour remained so dull while wheat was so animated. In a nominal way flour has advanced, that is, manufacturers



NOBLE & HALL'S HIGH-CLASS HORIZONTAL ENGINE.

The valve-slide is very large and has two heavy angle-boxes, so that a straight eccentric rod is used. The steam-chest is placed low in the bed, so that the ports are below the bore of the cylinder, thus draining the cylinder, a very important point. The ports are larger than the steam-pipes, giving an easy entrance and exit of steam. The upper slides have an ornamental stiffening piece so the operator can run under-stroke, if desired, without springing the same. The cross-head has a wide bearing, and the pin is turned on the Coates patent cross-head machine, which makes it perfectly true. The brasses are large and are made from the box-metal. The larger brasses, 16x24 inches and larger, they bore out and line with genuine babbitt-metal. The wrist-pin, piston, valve-rods and valve-pins are all made of steel. The connecting-rods and shafts are of hammered iron. The crank is a heavy disc-plate, balanced. The wrist-pin holes are bored with a special parallel boring-machine, which does true work. The main journal is a heavy angle-box, with cap fitted in at each end, so that the metals takes the main thrust or blow of the engine instead of the bolts. The eccen-

are asking more for it excepting in a small way, because dealers will not buy. —Minneapolis "Market Record."

#### SOMETHING ABOUT CROP ESTIMATES.

Dodge wires that his March estimate means what it says and that the 156,000,000 bushels of wheat he advertises is "on the farms." It is now in order for him to count all the chestnuts and chincapins in the country. Dodge is an ar-rant old fraud and should be suppressed for the good of the public. —Chicago "Daily Business."

Personal abuse of Mr. Dodge or the Secretary of Agriculture has no weight with thinking business men. If the statements of the Department of Agriculture are incorrect, a plain correction in a statistical way is all that is needed. Merely saying that statements are incorrect, without satisfactory proof, have no force whatever. —Chicago "Daily Trade Bulletin."

Retreat is made by the bumptious "Bradstreet's." It is getting ready for its usual statistical flop. Referring to the report of wheat in farmers' hands it says: "We are not pre-



pared to declare that the Department report is inaccurate, nor to insist upon the essential accuracy of our own report." And again: "We have no specific reason for believing that our totals for the six winter-wheat States are more nearly accurate than any others." Of course not! No one has any specific reason for believing in "Bradstreet's" crop reports at any time or under any conditions. That bumptious journal has never been famous for "essential accuracy" in its reports. Every year it guesses and estimates, but it never has gathered enough actual information concerning wheat to entitle its totals to anything else than contempt. The trade are finding out the utter worthlessness of its pretended reports. After all is said, it remains true that the Dodge reports are the only ones issued that deserve the least consideration by business men.

#### THE "BUFFALO" BELT FASTENER.

In the engravings herewith is illustrated the "Buffalo" belt-fastener, sold by the Case Manufacturing Company, of Columbus, O. This fastener is patented in both the United

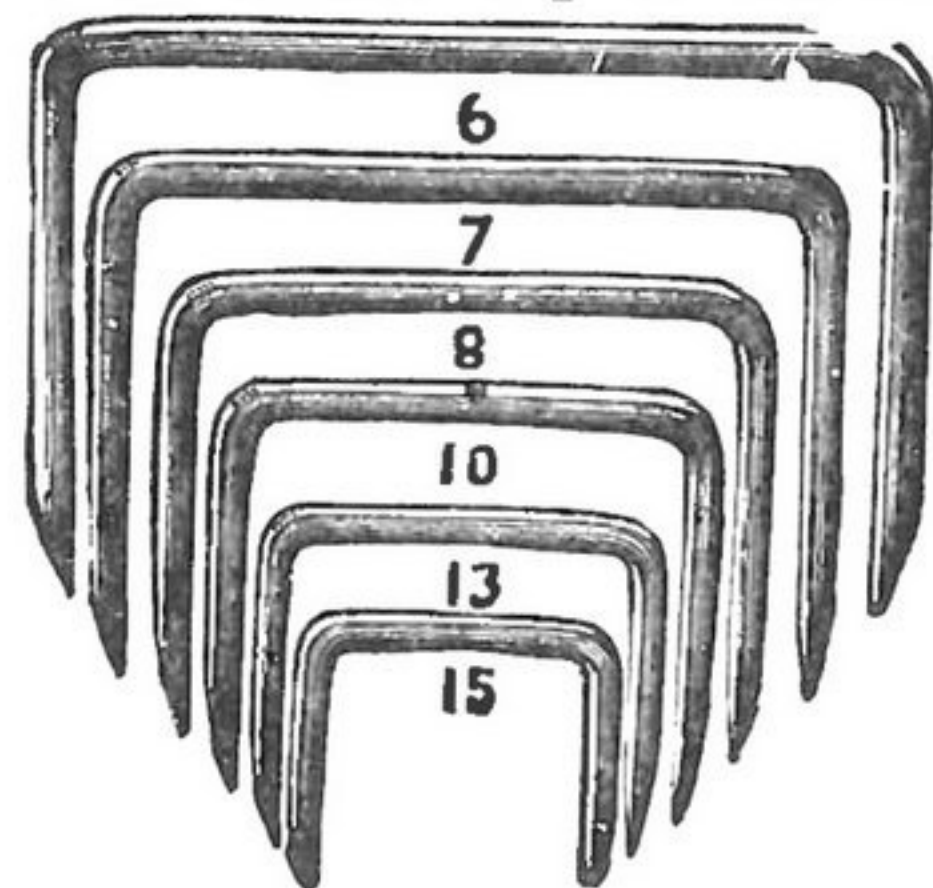


FIG. 1.

States and Canada. A glance at the engravings will show the points of this cheap, simple and practical article. In Fig. 1 are shown the sizes. The object of the makers is to introduce an article that can be applied without the aid of one or more tools, which usually are more expensive than the fasteners themselves, and useless for any other purpose. They feel confident that in recommending pliers they recommend a tool found in almost every workshop, and one that can be used for a thousand other purposes. Fig. 2 shows the manner in which the fasteners should be used. After they are driven from one side and clinched, drive some from the side to which the first ones were clinched. In order to

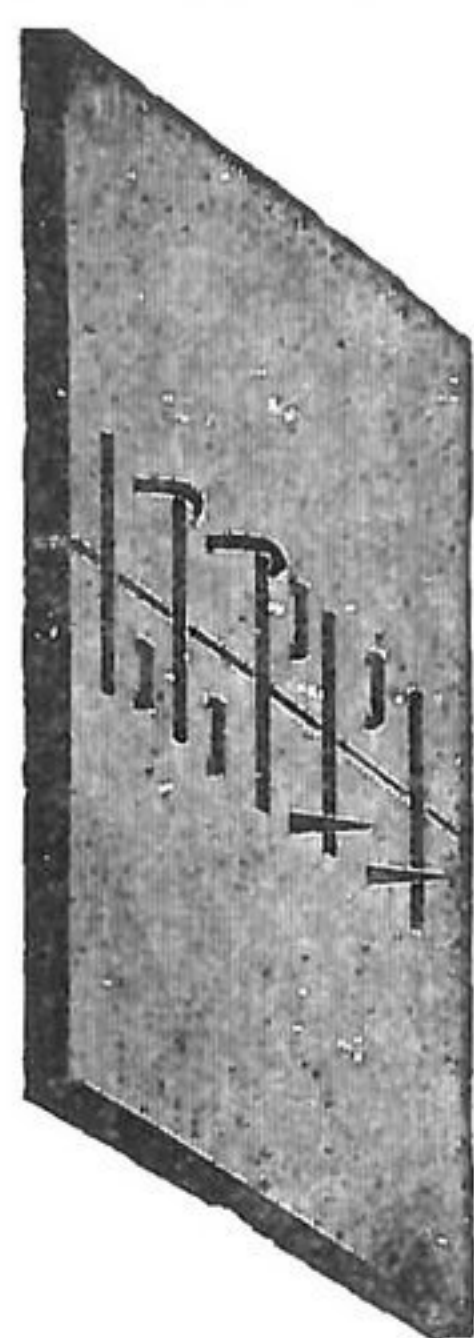


FIG. 2.

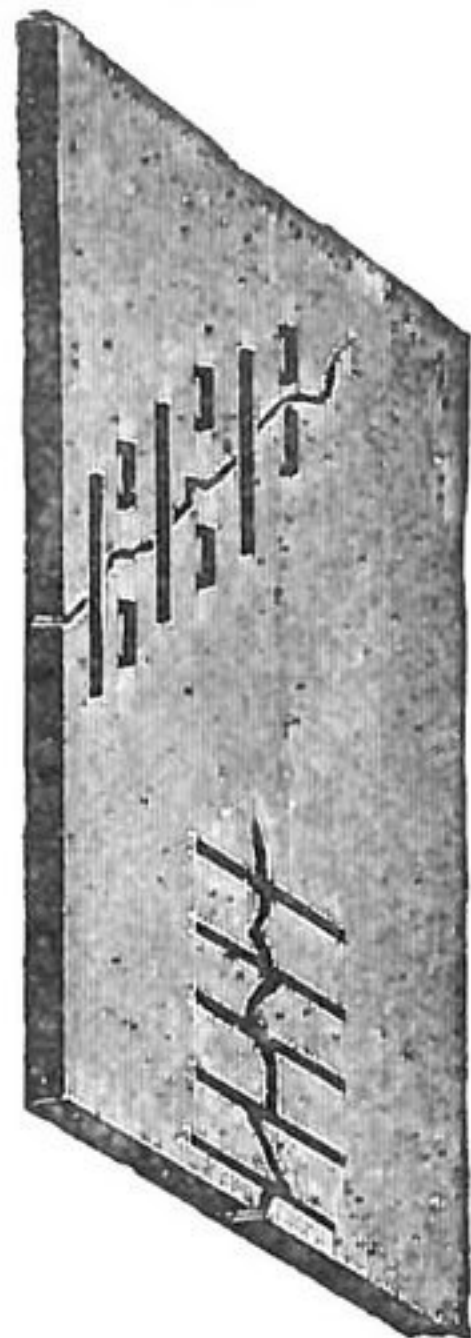


FIG. 3.

clinch perfectly, use a pair of pliers to curve the point with uniformity, and drive them back into the belt. Fig. 3 shows another very excellent feature of the fastener. An old belt may be repaired and made fully as strong as ever, and cut and torn belts may be fastened, no matter how they are torn. Remnants of old and new belting can be repaired, fastened together and used, while joints that are parting can be securely fastened. In an ordinary establishment large sums of money which are paid for new belting can be saved by carefully using these fasteners. The makers give the following directions for using: For light single and very small belts use No. 15. For ordinary single belts and general purposes use No. 13. For extra-heavy and wide single belts and for

small and light double belts use No. 10. Nos. 13 and 10 may also be used on smaller sized 3 and 4 ply rubber and cotton belts. For ordinary double belts and wide 4-ply rubber and cotton use No. 8. For extra heavy and wide double leather and rubber belts Nos. 6 or 7 should be used. The makers claim for this fastener: 1. It is the most simple and easiest applied. 2. It contains the best metal of any fastener in use. 3. It makes a pliable joint, easily running over small pulleys. 4. It is adaptable to fast running belts for planers, matchers and machines where pulleys are run on each side of the belt, and where endless belts only can be used. 5. It is the best in the world for repairing old and broken belts and can be applied to all parts of any belt.

#### MILLERS TO MEET AT FORT WAYNE

Secretary D. H. Ranck, of the Indiana Millers' Association, announces that the millers of Ohio and Michigan are invited to meet with the Indiana millers in tri-state convention at Fort Wayne, Ind., Tuesday, May 13. The city authorities and Business Men's Exchange of Fort Wayne have formally assured the millers a cordial welcome to their city and a generous hospitality. The secretary will issue a circular giving detailed information and the programme of the meeting. Reduced fares on all railroads are assured. The Associations of Ohio and Michigan have formally accepted invitation. The National Association will co-operate.

#### MILLING PATENTS.

Among the patents granted March 25, 1890, are the following:

Chas. S. Rogers, Fort Reno, Ind. Ter., No. 423,955, a flour-safe.

James B. Dobson, Cleveland, O., No. 424,100, a bolting-reel, comprising the combination, with a shaft, a reel surrounding the shaft and supported in bearings formed in the casing, and gearing connecting the reel and shaft, whereby they are rotated simultaneously but at unequal rates of speed, of a feed-trough leading to the reel at one end, a discharge-spout leading therefrom at the opposite end, and brushes secured to the shaft and engaging the internal surface of the reel, said brushes having spiral tread or lead; and also the combination, with casing having metal heads bored to fit the respective reel-heads, the edges of the casing-head having internal circumferential grooves, of metal reel-heads adapted, respectively, to operate in the heads of the casing, such reel-heads having peripheral tongues adapted to fit the grooves of the casing-heads.

James A. Woodbury, Winchester, Mass., and Edward F. Woodbury, Boston, Mass., No. 424,157, a dust-collector.

Chas. H. Stubbley, Knottingley, County of York, England, No. 424,232, driving sifting apparatus.

### SPECIAL NOTICES.

#### BOLTING CLOTH.

Do not order your cloth until you have conferred with us. It will pay you, both in point of quality and price. We are prepared with special facilities for this work. Write us before you order.

CASE MANUFACTURING CO.,  
Columbus, Ohio.

Office and Factory, 5th Street, north of Naughten.

### TOLEDO MILL PICKS AND STONE TOOL MFG. CO.

Manufacturer



and Dresser of

### MILL PICKS.

Made of the best double-refined English cast steel. All work guaranteed. For terms and warranty, address, GEO. W. HEARTLEY, No. 297 St. Clair Street, Toledo, Ohio. Send for Circular.

N. B.—All Mill Picks ground and ready for use (both old and new) before leaving the shop. No time and money lost grinding rough and newly dressed Picks. All come to hand ready for use.

ALSO MANUFACTURERS OF

Shafting, Pulleys, Hangers, Coupling, Machine and  
Jobbing, Etc., Etc.



# Practical Notes

**A NOVEL SCREW.**—Screws of all kinds are still a theme for study, especially in the wood-working line. Some one has proposed to make them hollow and, after they have been driven into place, to expand them a trifle with a wire nail to get more of a bind in the wood.

## GENERAL NOTES.

NORWAY has 1 university, 46 professors and 880 students; France has 1 university, 180 professors and 9,300 students; Belgium has 4 universities, 88 professors and 2,400 students; Holland has 4 universities, 80 professors and 1,600 students; Sweden has 2 universities, 173 professors and 1,010 students; Russia has 8 universities, 582 professors and 6,900 students; Portugal has 1 university, 40 professors and 1,300 students; Denmark has 1 university, 40 professors and 1,400 students; Spain has 10 universities, 380 professors and 16,200 students; Italy has 17 universities, 600 professors and 11,140 students; Switzerland has 3 universities, 90 professors and 2,000 students; Germany has 21 universities, 1,020 professors and 25,084 students; Great Britain has 11 universities, 334 professors and 13,400 students; Austria has 10 universities, 1,810 professors and 13,600 students; The United States of America has 360 universities, 4,240 professors and 69,400 students.

### MISCELLANEOUS MILLING POINTS.

J. MURRAY CASE.

X.

Next to the rolls the purifier may be regarded as the most important machine in the modern system of milling. There is not so much difference in the results produced from different machines as many people suppose. One fact is clearly demonstrated, that is, to obtain good middlings from any purifier, however perfect its construction, the middlings must go to the machine in a good condition. The mechanical principle which produces the separation of the fibrous matter from the middlings is simply a current of air passing up through the cloth, which causing the fibrous matter to rise to the top, some of it is floated off over the tail, and the lighter particles are carried out through the eye of the fan. To carry out this principle, a great number and variety of machines have been constructed, in any of which good work may be performed; and it is not infrequently the case that machines embodying the very highest merits are condemned and those of lesser value put in, for the reason that the material passing to the machine is in an imperfect condition; consequently good middlings can not be obtained, and the miller blames the machine.

In all the efforts to improve the machine it can be truthfully said that no great advance has ever been made upon the simple system of a shaking riddle with an air-trunk above and a current of air through the cloth. The application of other auxiliary attachments to this principle may assist somewhat, but generally adds so much to the complication that the machines are liable to get out of order unless closely watched, and the result is, in the aggregate, that they do no better work than the simple sieve with suction. One of the most important points about a purifier is to distribute the material perfectly over the entire face of the cloth. To accomplish this a shaking tray or vibrating feed-box has proved itself unquestionably superior to any other device, is perfectly automatic in its operation, and requires no attention whatever. In purifiers it will often be found that the material will go backward towards the head of the machine, or gather up in bunches upon some points in the cloth.

This may be due to two causes, (1) the sagging of the cloth in such a manner as to form an elevation towards the tail of the machine, which the material has to climb over, and instead of doing this it runs backwards or vibrates back and forth. This may be remedied by seeing that the cloth is perfectly stretched. (2) Another reason for the material

running backwards on the cloth is an imperfect shaking of the riddle. If there is any vibration in the middle which produces an elevation of the sieve at the return stroke towards the head of the machine, this will cause the material to run towards the head, because the material is thrown upward at the wrong end of the stroke, the sieve passes under it, and consequently carries it backward instead of forward. This can be overcome by stopping the vibration. The material is also often found to run sideways on a purifier. This is generally due to some imperfection in the eccentric, the stroke of one eccentric being somewhat longer than that of the other, or it may be due to the frame of the sieve striking against some stationary surface.

The purifier is the most sensitive machine in the mill and should be kept always in absolutely perfect working order. The eccentrics should be perfect, the feed distributed perfectly, the cloth kept perfectly stretched, and suitable devices used to keep it clean. If this is done, and the suction taken near the tail of the machine, whereby the greatest suction is obtained at that point, and gradually decreasing as it reaches the head of the machine, the machine, whatever its construction may be, will do good work.

The automatic delivery of all of the material, from the time the wheat enters the first-break until it passes off as flour and offal, is of great importance; but few mills are so constructed; nearly all of them have hoppers over the different rolls and purifiers, whereby a quantity of stock is accumulated. This accumulation may gradually become greater until it becomes necessary for the miller to open the feed-gate widely and permit it to pass off. If this feed-gate is opened at the head of the mill, it necessarily floods the mill from head to tail, producing a larger quantity of offal. When this surplus material has been run off, the feed-gate will be found to be feeding probably only two-thirds of the space across the roll. Then another injury occurs by the grinding of the material on only a part of the surface of the rolls. Thus it keeps the miller constantly adjusting back and forth, as it is impossible to set the machines so that there will be neither an increase nor a decrease of material. Consequently it is of great importance that this difficulty should be overcome, and it can be, by the use of proper feeds for supplying the different materials to the different machines; and these feeding-devices should be so perfect that there should be a constant and unvarying stream passing from the head to the tail of the mill, precisely the same as a body of water passing over a mill-dam. Then we may hope to produce not only an even result, but secure the very best possible finish, and run the mill to the very best possible advantage.

There is a great variety of systems for the manipulation of the different stocks in the mill, and most of these systems will produce good work, but some of them are far more elaborate than others. They reach a given point by passing around a greater distance, as it were. In the early introduction of the roller system the manipulations were much more extensive than at present, but gradually the unnecessary operations have been eliminated, until the most perfect system is that which accomplishes the work with the least manipulation possible. Every time the material is passed over a scalper, reel or elevator, or through a worm, there is a production of a quantity of fine flour which has been produced during the time that the impure material was intermingled with the pure, and consequently this flour is not only soft, but it is of a dark color; and the greater number of useless manipulations that we have, the greater will be the quantity of this material produced; consequently they should be avoided as far as possible.

I may also say that there are a great many mistakes made by millers who have had only a limited experience in the operation of two or three mills in undertaking to programme their mills without the employment of thorough expert talent. It generally leads to very many changes after the mill is in operation and much loss before the mill becomes perfectly successful. Assuming that two men are possessed of an equal degree of natural talent, it necessarily follows that the one who has had the largest experience in the matter of separations will be able to construct the most perfect mill.



There are many points in milling which are purely theoretical and upon the basis of theory seem to be correct, and it is not infrequently the case that those who have not had extensive experience are liable to drift into these theoretical ideas and condemn the experienced expert, who has been

through all this field of experiment and knows its merits and demerits. So I may say that however well posted a miller may be, he will never lose anything by counseling with those whose experience has been more extensive than his own.—London "Millers' Gazette."

**PREJUDICE** Investigate the merits of the Reliance Safety Water Columns. It pays to keep posted. Many of the largest corporations have found it profitable to discard the old appliances and adopt these safeguards. There is always economy in safety. Send for illustrated price-list.

Reliance Gauge Co., 831 Sheriff St., Cleveland, Ohio.

**THE "HARLOW" Positive Feed Lubricators.**

For Marine and Stationary Engines, Steam Pumps, Electrical and other Machinery.

MAXIMUM ECONOMY IN OIL. MARKED ECONOMY IN FUEL.

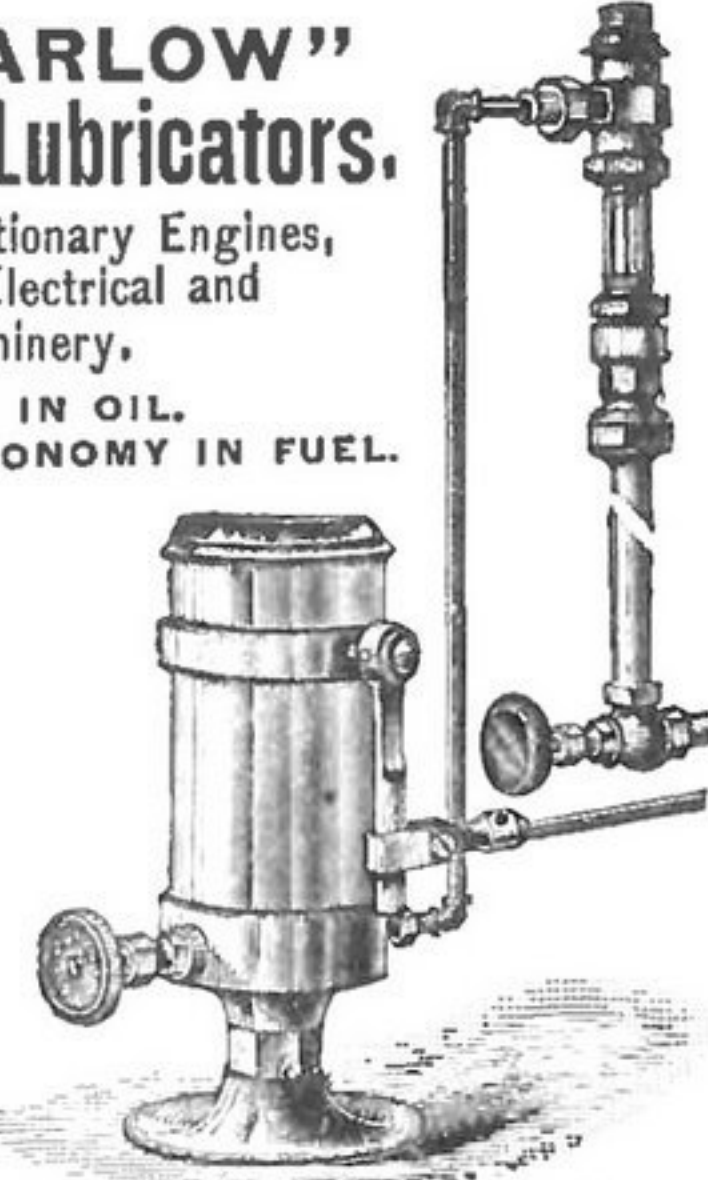
Not dependent upon or operated by Steam Pressure, Condensation or Gravity.

Not affected by changes of temperature.

BEING operated by some moving portion of the engine or machine to be lubricated, the "Harlow Lubricator" starts and stops with the engine or machine being lubricated, without requiring the slightest attention from the engineer or operator, always delivering the oil in any amount from a drop to a constant stream.

The cup can be filled at any moment while the engine or machine being lubricated is in operation, without causing any leakage either of oil or steam.

Harlow Lubricator Mfg. Co. BOSTON, Mass. U. S. A.



**"Cooper on Belting"**

A Treatise on the Use of Belting for the Transmission of Power. With illustrations of approved and actual methods of arranging Main Driving and Quarter Twist Belts, and of Belt Fastenings. Examples and Rules in great number for exhibiting and calculating the size and driving power of belts. Plain, Particular and Practical Directions for the Treatment, Care and Management of Belts. Descriptions of many varieties of Beltings, together with chapters on the Transmission of Power by Ropes; by Iron and Wood Frictional Gearing; on the Strength of Belting Leather; and on the Experimental Investigations of Morin, Briggs, and others, for determining the Friction of Belts under different tensions, which are presented clearly and fully, with the text and tables unabridged. By JOHN H. COOPER, M. E. Second Edition. One vol., demi octavo. Cloth, \$3.50. Sent post-paid on receipt of price. Address,

McFAUL & NOLAN, BUFFALO, N. Y.

**THE INK**

WITH WHICH THIS PAPER IS PRINTED IS MADE BY THE

**QUEEN CITY PRINTING INK CO.**

CINCINNATI, O.

## THE BEST AND CHEAPEST CORN AND COB CRUSHER IN THE WORLD.

All wearing parts cast of a steel mixture. Notice difference in construction. Most area where most work is done, where all other crushers have least area where most work is done. Low priced machinery is not the cheapest, considering durability and efficiency. Sent on 30 days' trial when satisfactory reference is furnished.

Please Send for Circulars.

**R. C. McCULLEY, LANCASTER, PENN.**

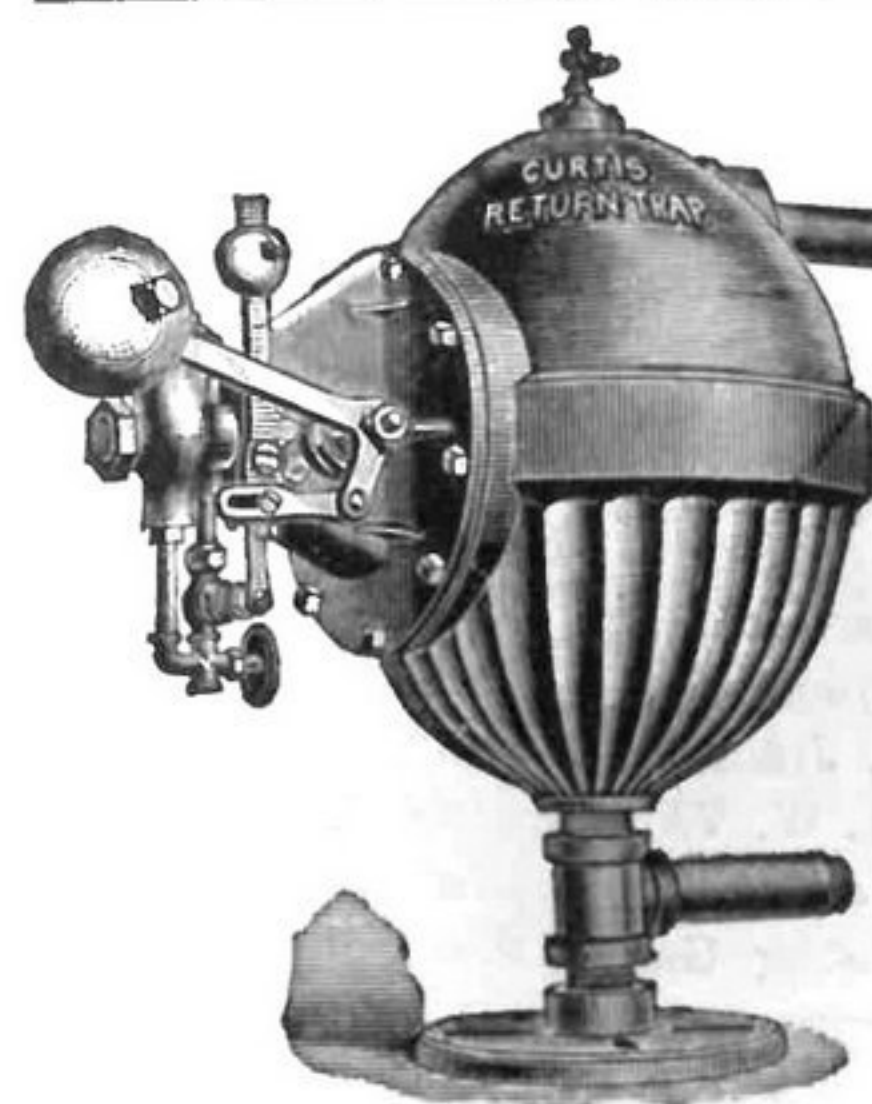
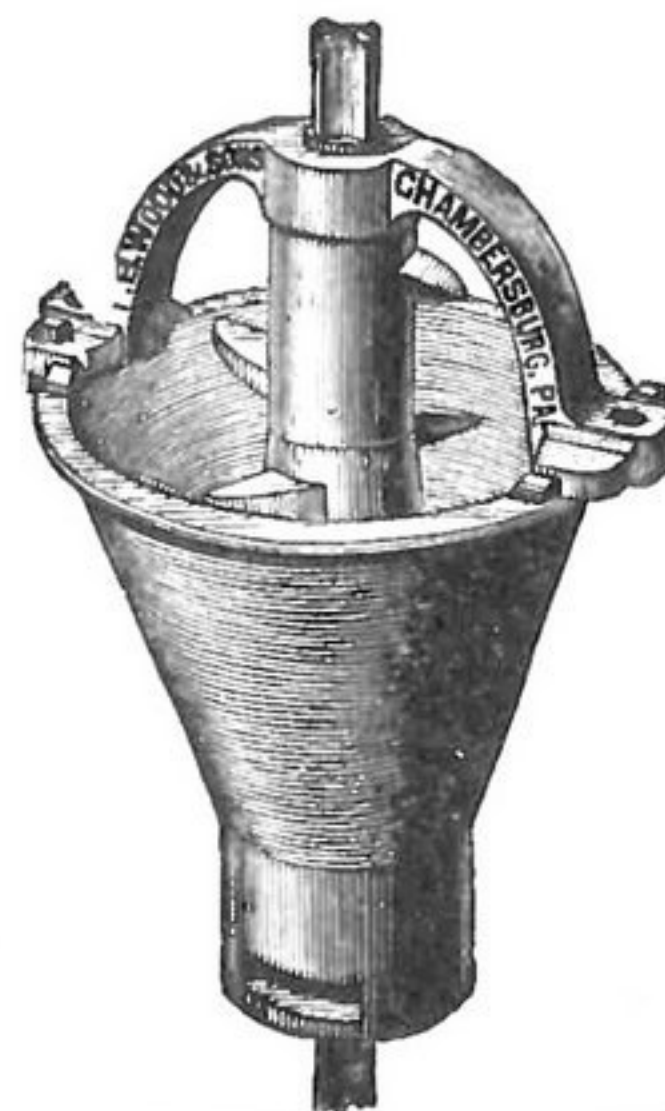
**\$15**

WILL BUY THE BEST AND CHEAPEST CORN & COB CRUSHER IN THE WORLD.

Our crushers are made of a "special quality" of material that insures years of service. Thousands of these crushers are in use throughout the United States and Canada. Send for circular, giving testimonials from millers who are using them, and know a good thing when they see it.

**T. B. WOOD'S SONS, CHAMBERSBURG, PA.**

Manufacturers of Shafting, Pulleys, Hangers, Mill Gearing, Etc.



## THE CURTIS PATENT RETURN STEAM TRAP.

It is noiseless, positive, rapid, will return all condensation back into the boiler, and works equally well in connection with reduced pressure or exhaust steam, also when the return is below the water line of the boiler.

**THE CURTIS REGULATOR COMPANY,**  
NO. 74 BEVERLY ST., BOSTON, MASS.

GENERAL AGENCIES.

New York, 109 Liberty st. Minneapolis, 210 S. Third st.  
Philadelphia, 2085 N. Front st. Chicago, 218 Lake st.

## The Canton Cabinet Filing Case Company, Canton, Ohio.

MANUFACTURERS OF

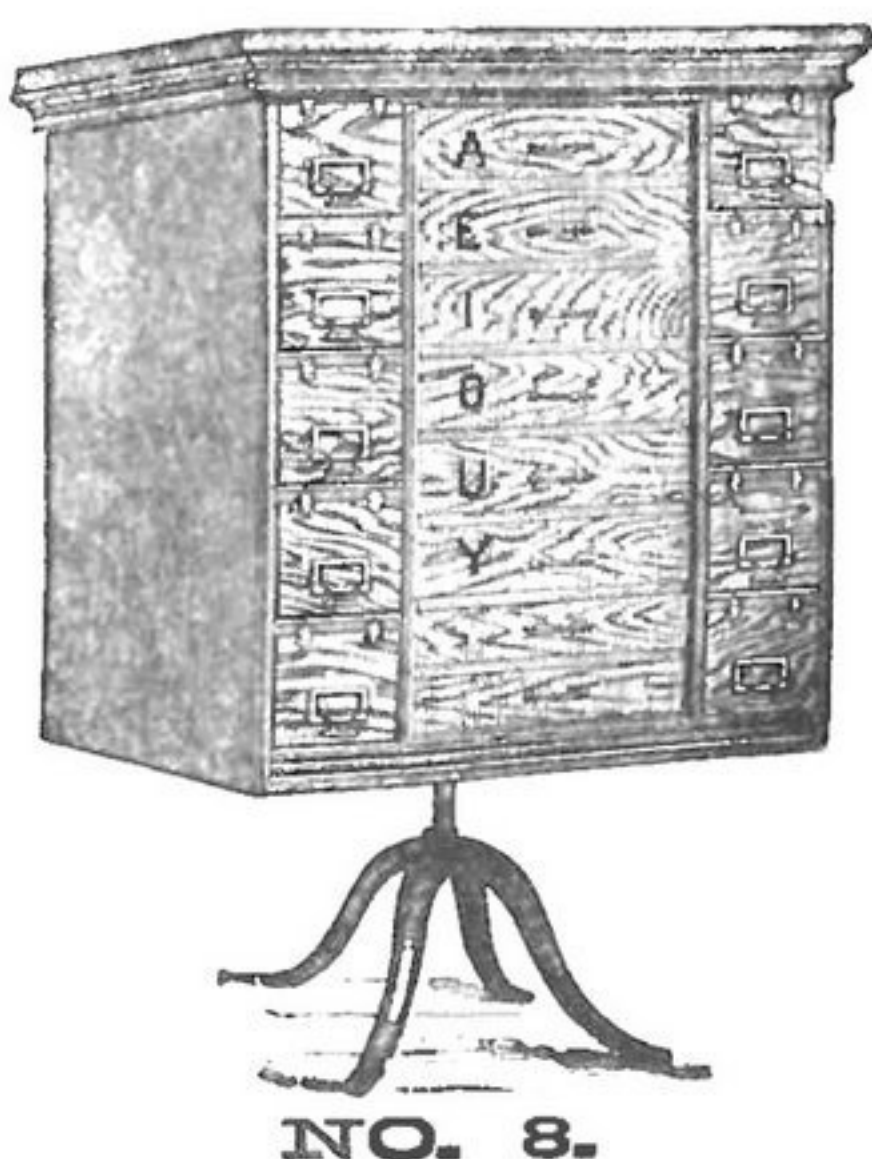
**The New Buckeye Document Case & Letter File; Also All Kinds Office Furniture**

**NO. 8** Represents one side of one of our Revolving Cabinet Letter Files and Document Cases Combined. It contains 30 Document Drawers and 8 Letter File Drawers. In filing letters we use first VOWEL of name on front of drawer, and LETTER FOLLOWING first VOWEL on Index Sheet within drawer. We also make more exhaustive systems which contain from 6 to 100 or more Filing Drawers.

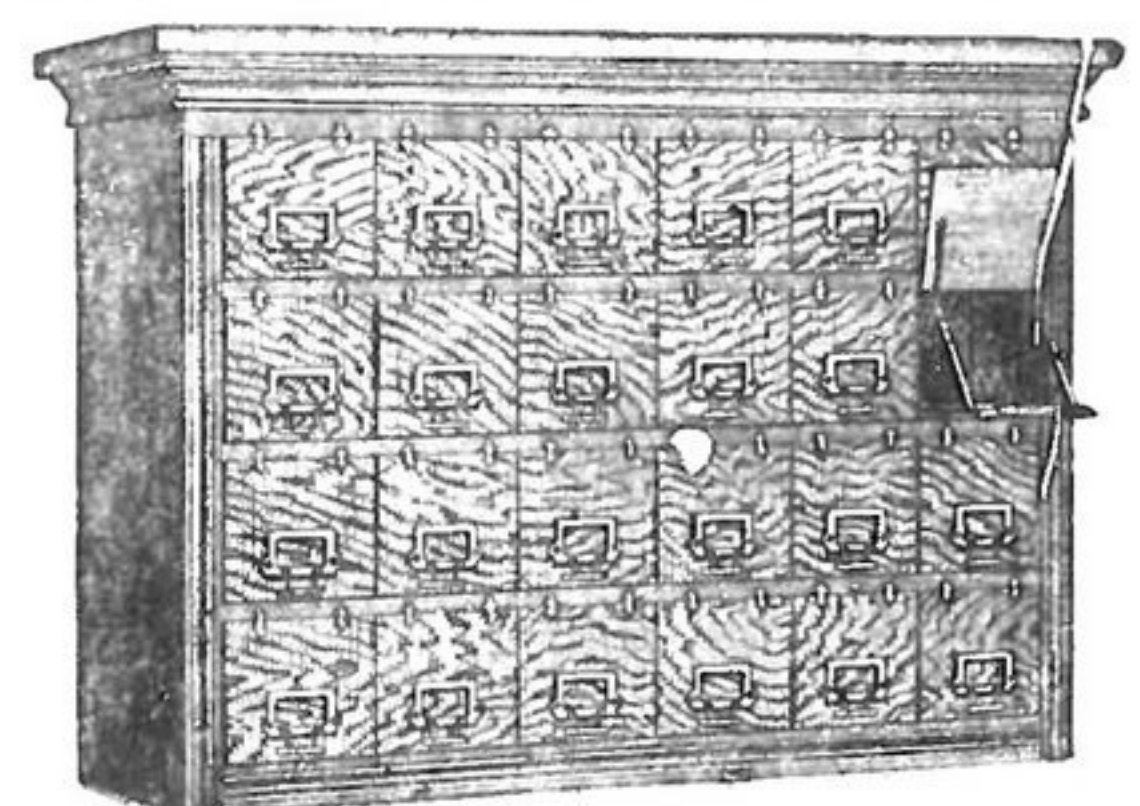
**NO. 1** Represents one of our small Document Cabinets, for use on desks or brackets. Action of drawer can be seen in the cut. When front is raised inner drawer comes forward, exposing contents of drawer for inspection.

Our Cabinet Files are Conceded to be the Most Convenient of Any in the Market. They are Compact, Simple, Complete, Durable and Ornamental.

**SEND FOR PRICE LIST AND CATALOGUE.**



NO. 8.



NO. 1.





Murat, Va., men project a roller-mill.  
 Enochville, N. C., men project a flour-mill.  
 Abilene, Tex., men project a grain-elevator.  
 J. C. Bright, Alderson, W. Va., remodels to ro'ls.  
 The Hawkeye Milling Co., Alton, Ia., quit business.  
 S. M. Chennault, Talladega, Ala., builds a grist-mill.  
 Aspden Bros., oatmeal millers, Minneapolis, Minn., sold out.  
 Barnard & Redmond, Union Grove, Ala., build a corn mill.  
 J. T. Bostic's steam flour and grist-mill, Stelby, N. C., burned.  
 C. W. Curtis' flour-mill, Yancey Co., S. C., burned; loss \$12,000.  
 W. M. Stringer, Stringer, Ala., wants machinery for a steam feed-mill.  
 Mr. Ferguson, Waco, Tex., build a grist-mill in the new town of Lott.  
 L. C. Seaton & Sons, millers, Teanaway, Wash., succeeded by Seaton Bros.  
 Geo. W. Hartwell, of G. W. & F. C. Hartwell, millers, Littleton, Mass., is dead.  
 Albany, Ga., men are building flour-mill and a 40,000-bushel grain-elevator.  
 J. F. Osborn's Sons, Clarksburg, W. Va., have completed a 50-barrel roller-mill.  
 F. McGinnis, Rome, Ga., wants corn-mill machinery for a mill in Printup City.  
 L. C. Sheppard and Hugh McBarley, Nashville, Tenn., will start a flour and grist mill.  
 J. McCardle's grain-elevator, Wingate, Ind., burned; loss \$12,000; insurance \$8,200.  
 J. J. Mott and others, Statesville, N. C., have formed a stock company to build a roller mill.  
 A. L. Camp, Rome, Ga., has bought the flouring-mill plant of the Etowah Furniture Co.  
 R. U. Kevil & Co., Princeton, Ky., have bought and will enlarge and operate a flouring-mill.  
 A. W. Dunn's grist-mill and other property, Pulaski, N. Y., burned; loss \$7,000; insurance \$5,000.  
 D. C. Brady and others, Gainesville, Tex., have incorporated the Brady Mill & Elevator Co., capital stock \$50,000.  
 Boyd Bros., Olmstead, Ky., sold their flour-mill to a stock company. They project a 75-barrel mill in some other town.  
 The Baltimore, Md., Elevator Co. project a 1,000,000-bushel grain-elevator at Canton in place of the one recently burned.  
 The Herman flouring-mill, Highland, Ill., capacity 800 barrels a day, was burned on March 21. Loss \$50,000; insurance \$24,000.  
 The Missouri Millers' Association estimates the acreage in that State at 40 per cent. more than last year, and it is stated that the crop is in excellent condition.  
 In spite of the opposition of the majority of the Baltimore Corn and Flour Exchange and the other commercial bodies of that city, the Maryland House of Delegates passed the bill providing for state inspection of grain.  
 Taking the whole area of the United States, the farm lands comprise 289 acres in every 1,000, leaving 711 acres unoccupied. Of the former quantity 153 acres are productive, 103 woodland, and 33 unproductive, though partly susceptible of improvement.  
 Among the recent orders received by the National Pulley Covering Co., of Baltimore, Md., for their Patent Friction Covering for pulleys may be mentioned the following: Baughman Bros., Richmond, Va., John T. Noye Mfg. Co., Buffalo, N. Y.; Nail City Lantern Co., Wheeling, W. Va., Springfield Foundry Co., Springfield, Mass., MacKellar, Smith & Jordan Co., Philadelphia, Pa., Vanderpoel & Co., Chicago, Ill., Lansing Gas

Light Co., Lansing, Mich., Schultz Bros., Philadelphia, Pa., French & Linforth, San Francisco, Cal., and W. S. & F. Cordingly, Newton, Lower Falls, Mass. Their orders for February came from 21 States.

Says the *Nebraska State Journal*: Seventeen years ago the price of corn was the same as it is to-day. It was burned by the farmers all over Nebraska and Kansas, and thousands of bushels went to waste on the ground. Sixteen years ago the farmers were buying corn at 75 cents and \$1 a bushel. While there is little probability that such a bound in prices will occur in the next 12 months, the experience should not be entirely wasted. Corn can not go much lower, and will probably be much higher. Wisdom dictates a hoarding of the present crop in Nebraska, except in cases where the farmer is absolutely obliged to sell. A little inconvenience in holding a few hundred bushels may bring a rich reward in the next six or twelve months.

In reviewing the outlook of wheat crops abroad Beerbohm's *London List* of March 14 says: The latest crop reports are very unfavorable, especially from the Punjab and the Northwestern Provinces, and it would appear that the total yield is not likely to reach last year's, which was 6,350,000 tons, against 7,027,000 tons in 1888. The Australian shipments this season are also likely to be less than was anticipated, judging from the latest reports concerning the South Australian crop, which estimate the yield at about 8 bushels per acre, giving a total of 16,000,000 bushels. This is considered a good yield for this colony, but it is far below the high estimates (12 bushel per acre) of two months ago. The aggregate wheat crops in the Australian colonies are now estimated not to exceed 36,000,000 bushels, and the surplus for Europe at about 1,250,000 quarters, of which about 250,000 quarters are already afloat, making (with about 100,000 quarters of old New Zealand wheat on passage) 350,000 quarters from all Australasia. The La Plata shipments for Europe during January and February are estimated at 60,000 quarters, but March and April are likely to show a much larger output.

#### BOOKS AND PAMPHLETS.

The April number of *Scribner's Magazine* is particularly rich in all the finest features of that popular periodical. The contents include: "Horace, Book I, Ode IV," translated by Archdeacon Wrangham in 1821; "Tadmor in the Wilderness," by Frederick J. Bliss; "The Rights of the Citizen," I, by Frederick W. Whitridge; "The Electric Railway of To-day," by Joseph Wetzler; "Expiation," X-XIII, by Octave Thanet; "Dawn and Dusk at Karnak," by Chas. Henry Lueders; "Javan Hackett's Ill-Mended Fortunes," by E. C. Martin; "In the Footprints of Chas. Lamb," II, by Benjamin E. Martin; "Wagnerianism and the Italian Opera," by Wm. F. Apthorp; "In the Valley," XXV-XXVIII, by Harold Frederic; "A Meeting," by Chas. E. Markham, and a pleasant miscellaneous department. All the many illustrations are particularly fine. This magazine is already in the front rank, and it shows signs of its ability to hold the high position it has reached in so short a time.

#### A NEW METHOD OF TREATING DISEASE.

##### HOSPITAL REMEDIES.

What are they? There is a new departure in the treatment of disease. It consists in the collection of the specifics used by noted specialists of Europe and America, and bringing them within the reach of all. For instance the treatment pursued by special physicians who treat indigestion, stomach and liver troubles only, was obtained and prepared. The treatment of other physicians, celebrated for curing catarrh was procured, and so on till these incomparable cures now include disease of the lungs, kidneys, female weakness, rheumatism and nervous debility.

This new method of "one remedy for one disease" must appeal to the common sense of all sufferers, many of whom have experienced the ill effects, and thoroughly realize the absurdity of the claims of Patent Medicines which are guaranteed to cure every ill out of a single bottle, and the use of which, as statistics prove, has ruined more stomachs than alcohol. A circular describing these new remedies is sent free on receipt of stamp to pay postage by Hospital Remedy Company, Toronto, Canada, sole proprietors.



**W.A. BINGHAM,**  
 MANUFACTURER OF  
**FLOUR SACKS.**  
 178 Duane Street,  
 New York.

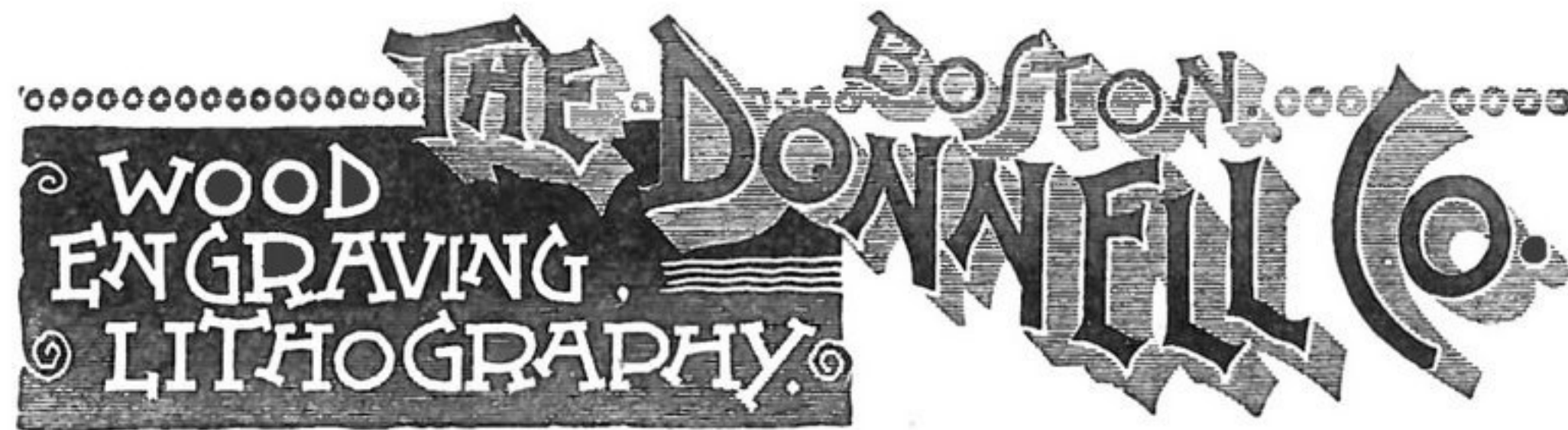


THE BEST ARE THE CHEAPEST.

THE PATRONAGE of the MILLING TRADE is MOST RESPECTFULLY SOLICITED.

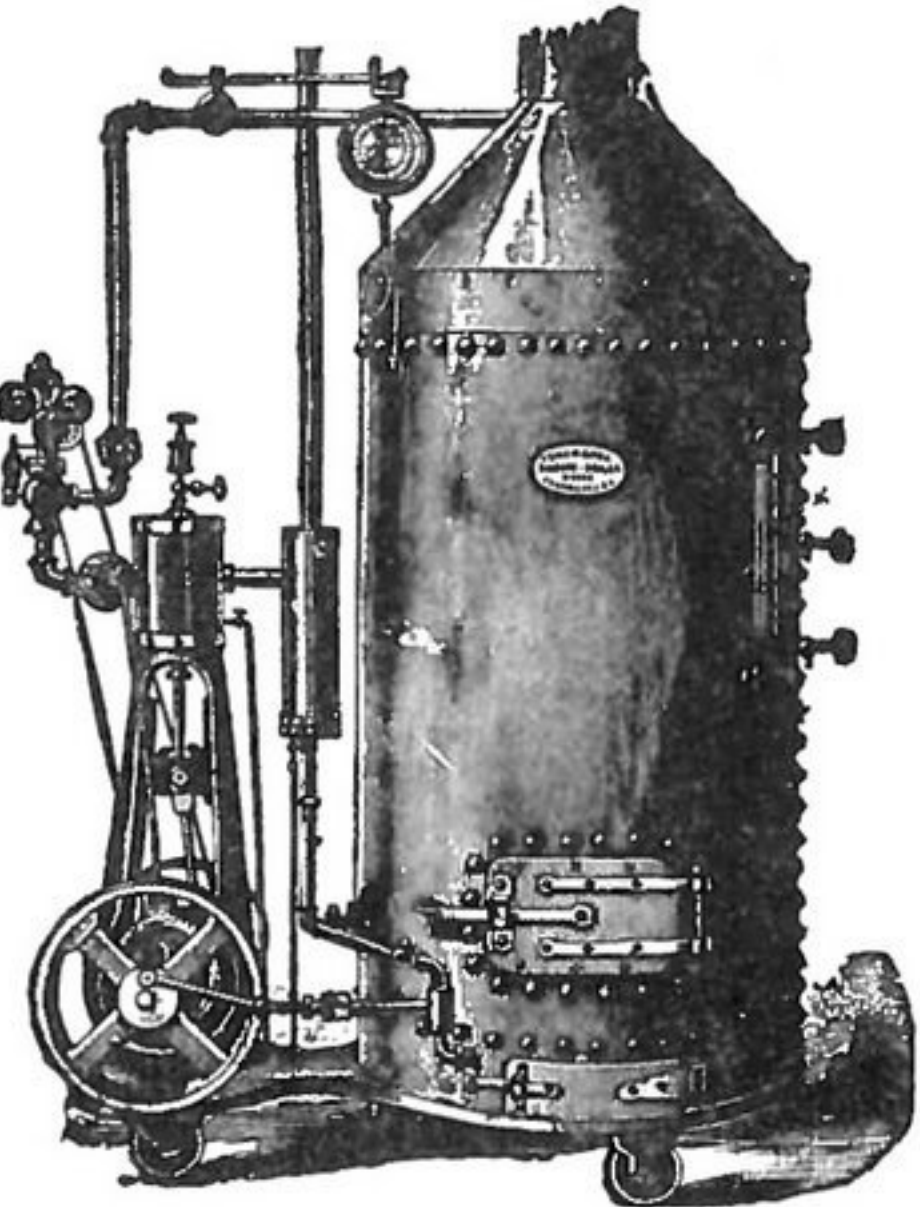
MILLERS' FLOUR SACKS A SPECIALTY.





## TONAWANDA ENGINE AND BOILER WORKS

The Best 6-Horse Power Semi-Portable Up-  
right Engine and Boiler Made.



SPECIAL PRICE. GUARANTEED.

ARMITAGE, HERSCHELL & CO.  
Tonawanda N. Y.

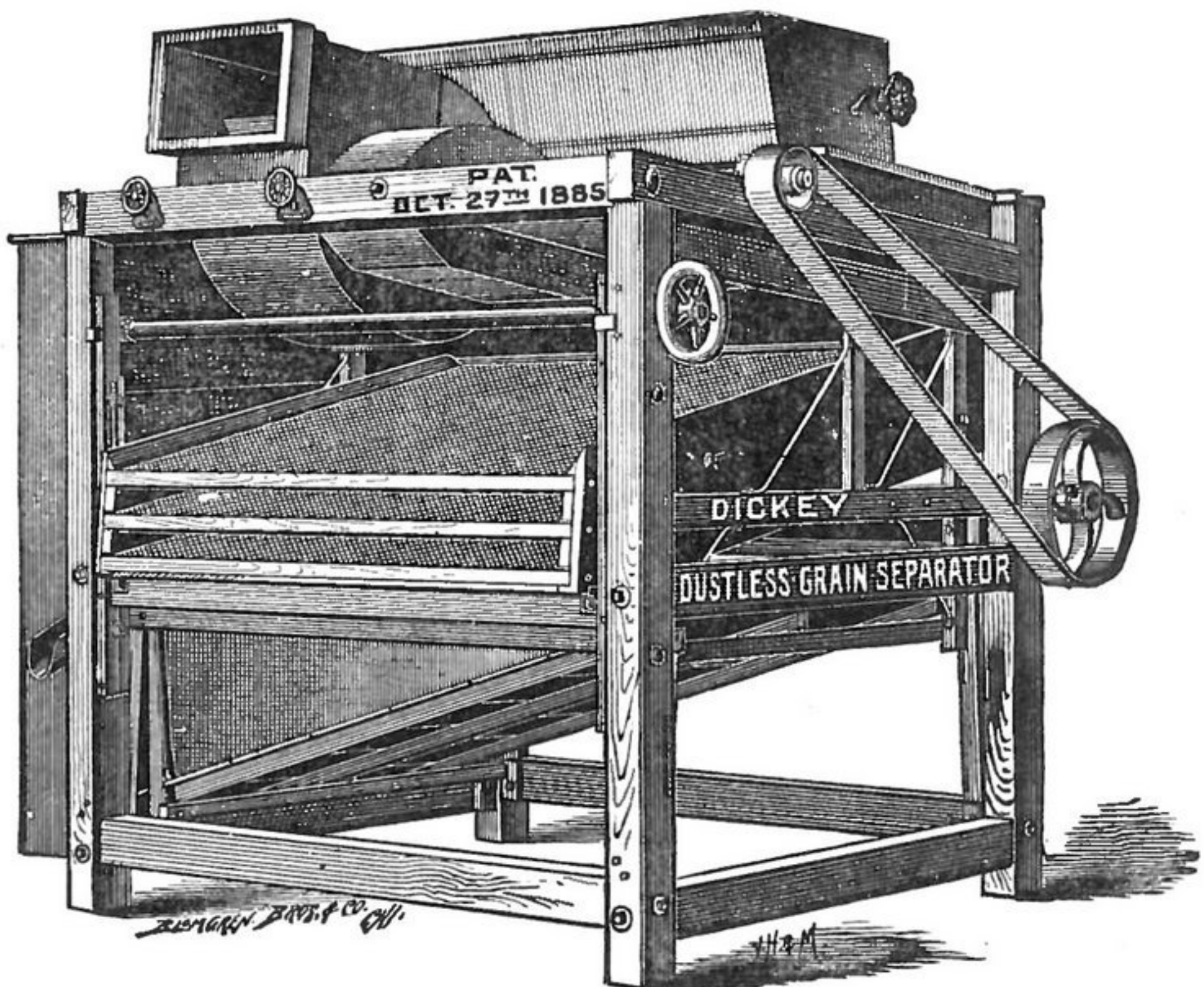
Sometimes  
Corrugated Iron is  
represented to be  
"just as good as" our  
Patent Edge Corrugation.  
While this is  
complimentary to  
our material,  
unfortunately it does  
not work out well  
in practice.  
The only Corrugated Iron  
that can be  
recommended for roofing  
is manufactured by

The Cincinnati Corrugating Co.  
PIQUA, OHIO.

## DICKEY DUSTLESS GRAIN AND FLAX SEPARATOR

This Separator is our latest and most perfect, and guaranteed to be the superior of any now on the market. This machine, as can be seen by the cut, is not a warehouse fanning mill with one patent attachment, but is Dustless Separator, made for the express purpose of thoroughly cleaning and separating all kinds of grain in large quantities; its construction is such that the working machinery and weight is all within the parts or anchors.

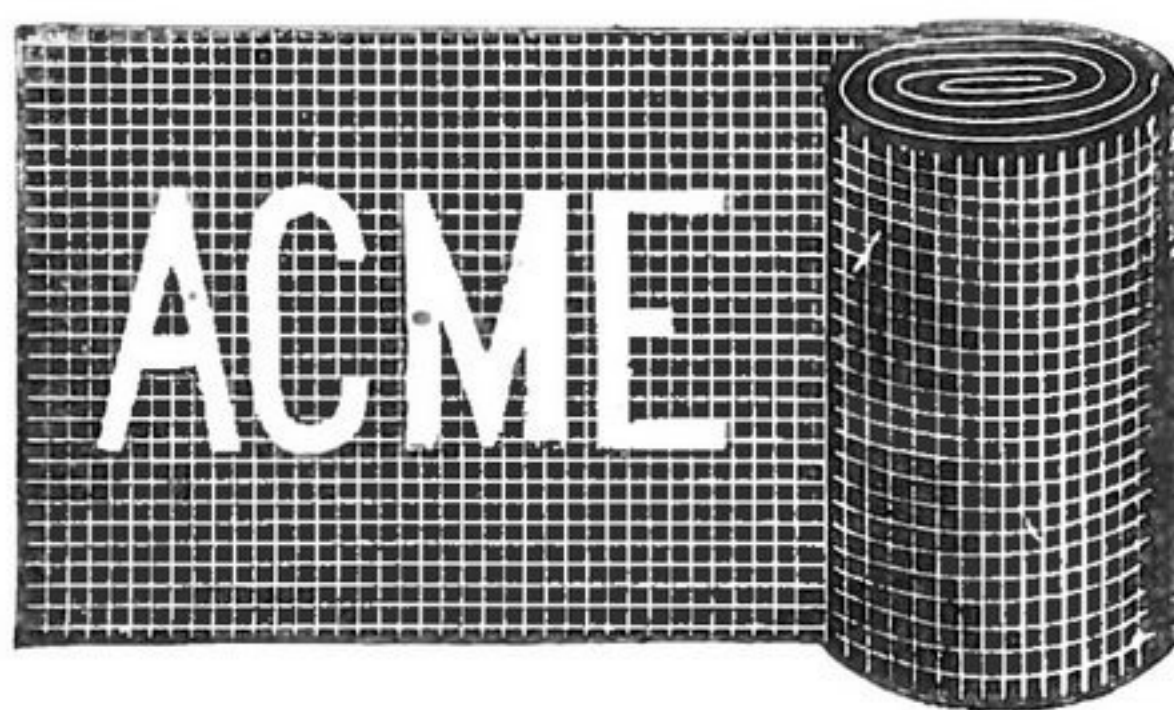
WE CLAIM FOR IT SUPERIORITY.



WE CLAIM FOR IT SUPERIORITY.

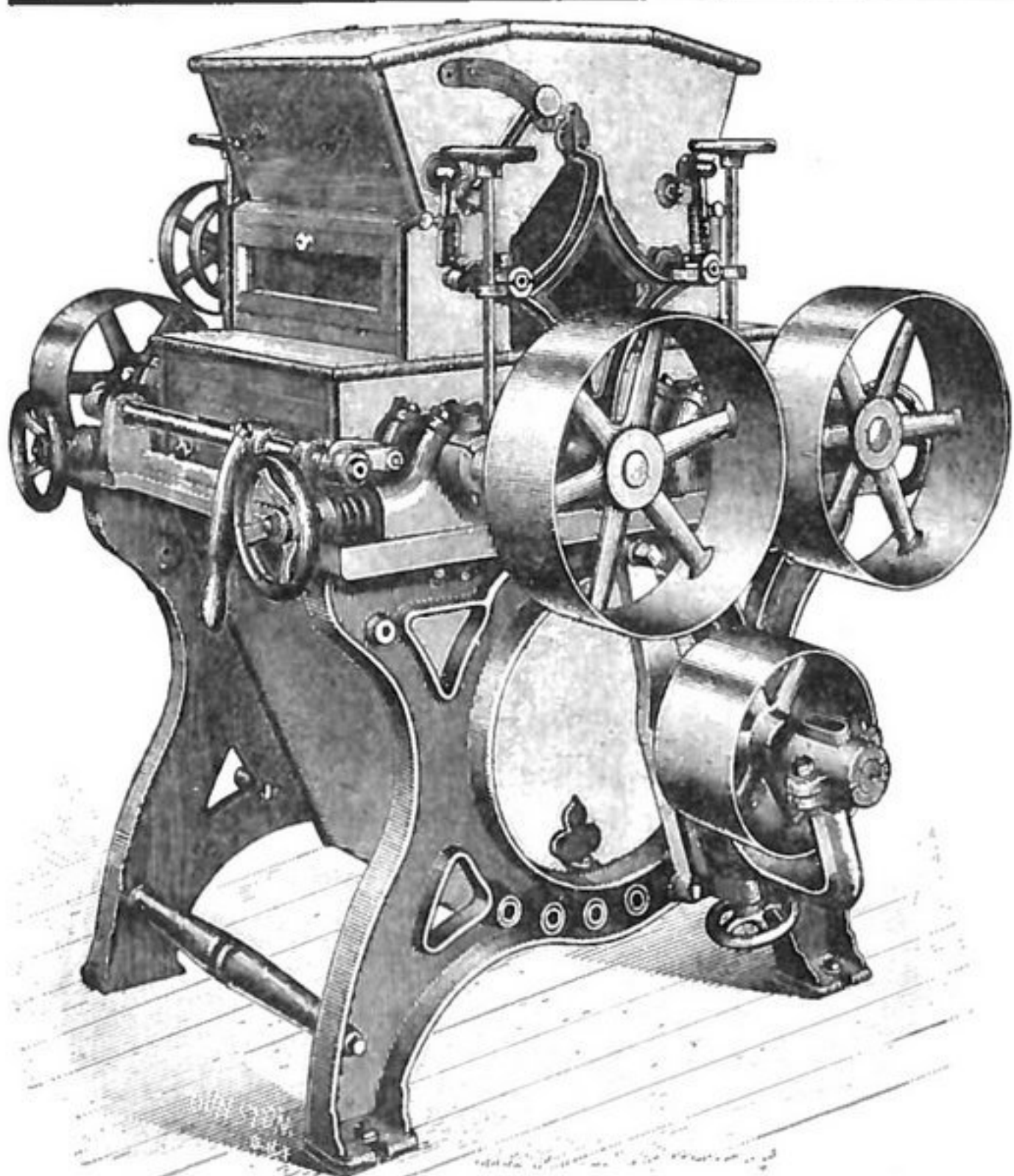
We claim for it Superiority over everything of the kind made, in simpleness, durability, saving of power, capacity and cost of construction. Its height will accommodate any number of spouts from different points, without moving machine. They have a capacity from 700 to 1,500 bushels per hour. We also control exclusively the manufacture of the celebrated Dickey Giant, End and Side Shake, Warehouse Mills, that have attained such a world-wide reputation. Sent on approval to any reliable party. For full particulars address,

A. P. DICKEY MANUFACTURING CO.. Successors to Dickey & Pease RACINE, WIS.



WHEN YOU WANT  
WIRE CLOTH

SEND TO  
Brooklyn Wire Cloth Works,  
107 JOHN STREET, NEW YORK.



## Munson Bros., Utica, N. Y.

MANUFACTURERS OF

## ROLLER MILLS

Plans and Specifications Furnished  
for Complete Mills.

SEND FOR PRICES.



## EUROPEAN ECHOES.

THE London "Daily Chronicle" of March 3 says: "The ravages of rust on the wheat crop have been more severe than was at first anticipated. It is estimated that in South Australia the loss to the farmers amounts to at least \$5,000,000, in Victoria to between \$2,500,000 and \$4,000,000, and in New South Wales to nearly \$2,500,000. The subject was considered of such importance that, during the sittings of the Australasian Association for the Advancement of Science in Melbourne, a meeting of scientists from the three colonies was held, and the desirability of holding a conference on the subject later on in the year was discussed."

THE port of Sevastopol will in 1893 be transformed into an exclusively military port, where all commerce will be interdicted. To replace it the Russian Government intend making Inkermann a large commercial port, and the necessary work will commence this spring and is expected to be terminated in about eighteen months. It is also intended to enlarge the port of Novorossisk, which enjoys the advantage of remaining open throughout the year, and which is destined to become the commercial entrepot of Russian grain. Batoum, the petroleum shipping port, is likewise to be extended, while Marimpol, which is at present of secondary importance, is to be made the principal exporting center of coal from the Crimea and other parts of South Russia.

SAYS the Liverpool "Corn Trade News" of March 12: This season it is evident that we must depend upon America doing greater things than she did the year before last; an exportation of 3,500,000 quarters will not satisfy Europe during the next four months. On the 1st March in 1888 the United Kingdom stock amounted to 2,500,000 quarters, compared with 1,370,000 quarters at present. The French stocks were 100,000 quarters smaller then than now. The American visible supply was 21,000,000 bushels bigger then than now. Russia was then in a position to export largely, which she did to the extent of over 300,000 quarters per week, say 5,281,000 quarters in the four months under review, of which the United Kingdom took 1,465,000 quarters and the Continent 3,816,000 quarters.

### THE MINNEAPOLIS CONVENTION.

The following is a notification sent out by the secretary of the Millers' National Association: "At a recent session of the Sub-Executive Committee of the Millers' National Association, it was decided to name June 17th to 20th, 1890, as the dates for the next annual convention, to be held at Minneapolis, Minn. A railroad rate of one fare for the round trip from points upon the lines included in 'The Western States Passenger Association' has been obtained. This includes Chicago, St. Louis, Kansas City, Council Bluffs and Milwaukee, and it is hoped that the same rate will be granted from points outside of this territory. It has been some time since a one-fare round-trip rate has been conceded to the National Association and, had it not been that the Wisconsin Central line and Chicago and Northwestern Railway took the initiative, compelling competing roads to follow suit, we should not have had it this year. It is hoped that millers will bear this in mind when purchasing their tickets. The very low railroad fare, combined with the fact that the next convention will be a very important one, as the National Association will be re-organized and a new constitution adopted, also the attraction which the city of Minneapolis will have for all millers, especially for those who have never had the opportunity to visit the greatest milling center of the world, should cause this meeting to be the largest convention of millers ever held. Excursion parties are already being organized in several milling states. The Executive Committee instructed the secretary to secure all possible data from exporters of flour, showing delays in shipment and other abuses suffered at the hands of transportation lines, such matter to be laid before the Inter-State Commerce Commission at an early date, with request for relief. It is hoped that millers will at once send such in-

formation as they may have upon this subject to the secretary of the National Association. Several threatening patent suits and complaints were considered and acted upon. The General Executive Committee was called to meet at Minneapolis on June 16th."

### ARID LANDS MADE TO YIELD CROPS.

The Department of Agriculture is prosecuting experiments in southwestern Kansas to test the value of the mulching process in arid lands for producing crops without irrigation. This experiment station is near Garden City, the locality being considered typical of the arid region generally. Two-hundred-and-forty acres were bought, 80 acres in one spot and 160 in another. The land was mostly open prairie, the surface a stiff clay loam, the top of which was baked by the sun into a firm crust almost as impervious to rain as so much slate. About 20 inches of rain fell in twelve months, pretty nearly the average throughout the desert belt, and of course it ran off without entering the soil. The superintendent of the station and his men set to work to see what could be done with the 80-acre patch. To 8 acres of the space they mainly confined their preliminary experiments; the rest, for the most part, they planted with forage for the mules and cattle, employing irrigation to help things along; but the 8 acres were not irrigated nor supplied with water in any manner artificially.

The 8 acres, as originally found, were covered with burr-grass and a prickly perennial weed with a long botanical name, that is regarded out West as a worse curse than the Canadian thistle, being even more difficult to eradicate. All this was cleared off in the early part of the previous fall, the soil was plowed and harrowed until thoroughly pulverized a foot deep, and last spring it was planted with grasses and forage plants. It was found that the winter's frosts tended to disintegrate the backed surface crust and render it readily arable. Only 8 acres were treated this way, because there were only seeds enough of the sorts desired to plant that amount of space. Forty kinds of grass and forage plant seeds were imported from abroad, including 18 or 20 varieties from India. These were all planted last spring on the 8 acres, in the dry pulverized soil, together with about a dozen species collected by the grass-gatherers from the prairies. The latter species were nearly all represented likewise by 11 varieties of grass, planted in the shape of sods, from 1 to 5 square rods of each, got within the neighborhood of the station. Such was the work of the spring last year.

The prickly weed persisted in reappearing and gave an immense deal of trouble; men had to go over the land constantly, with gloves, and pick it out by hand. No water was contributed artificially to the ordinarily-parched land. Part of the 8 acres was covered with matted straw after the planting, and part was not. The area left uncovered produced very little, for, as is usual in that region of wind-swept plains, the powdered surface soil, with the seeds put in it, was blown away. But the part covered with the straw produced, without a drop of water supplied, save from the scanty rains, a far more abundant crop than was raised, with first-rate irrigation to help, on the rest of the 80 acres, which had been sown to feed the mules and cattle of the expedition. Two things are needed, the ground must be pulverized deeply, to make a bed for holding the water that falls in rain, and the planted surface must be covered, after the sowing of the first crop, with matted straw. Subsequent crops will require no straw, for the reason that the matted roots will keep the dry earth from being blown away.

### CATARRH.

CATARRHAL DEAFNESS—HAY FEVER.

A NEW HOME TREATMENT.

Sufferers are not generally aware that these diseases are contagious, or that they are due to the presence of living parasites in the lining membrane of the nose and eustachian tubes. Microscopic research, however, has proved this to be a fact, and the result of this discovery is that a simple remedy has been formulated whereby catarrh, catarrhal deafness and hay fever are permanently cured in from one to three simple applications made at home by the patient once in two weeks.

N. B.—This treatment is not a snuff or an ointment; both have been discarded by reputable physicians as injurious. A pamphlet explaining this new treatment is sent free on receipt of stamp to pay postage, by A. H. Dixon & Son, 337 and 339 West King street, Toronto, Canada.—*Christian Advocate*.

Sufferers from Catarrhal troubles should carefully read the above.



**COMPOUND** Condensing or Non-Condensing.  
16 SIZES, 5 to 500 H. P.  
Not yet equaled by any form of Engine for  
**HIGH FUEL DUTY AND SIMPLICITY.**

**STANDARD** 13 Sizes in Stock.  
5 to 250 H. P.  
3000 in use in all parts of the Civilized World.

**JUNIOR** 6 Sizes in Stock,  
5 to 50 H. P.  
An Automatic Engine cheaper than a Slide Valve.  
WELL BUILT. ECONOMICAL. RELIABLE.  
Over 300 Sold the First Year.

All the above built strictly to Gauge with  
INTERCHANGEABLE PARTS.  
REPAIRS CARRIED IN STOCK.  
SEND FOR ILLUSTRATED CATALOGUES.

**WESTINGHOUSE  
ENGINES**  
The Westinghouse Machine Co.  
PITTSBURGH, PA. U.S.A.

SELLING DEPARTMENT IN THE  
UNITED STATES.

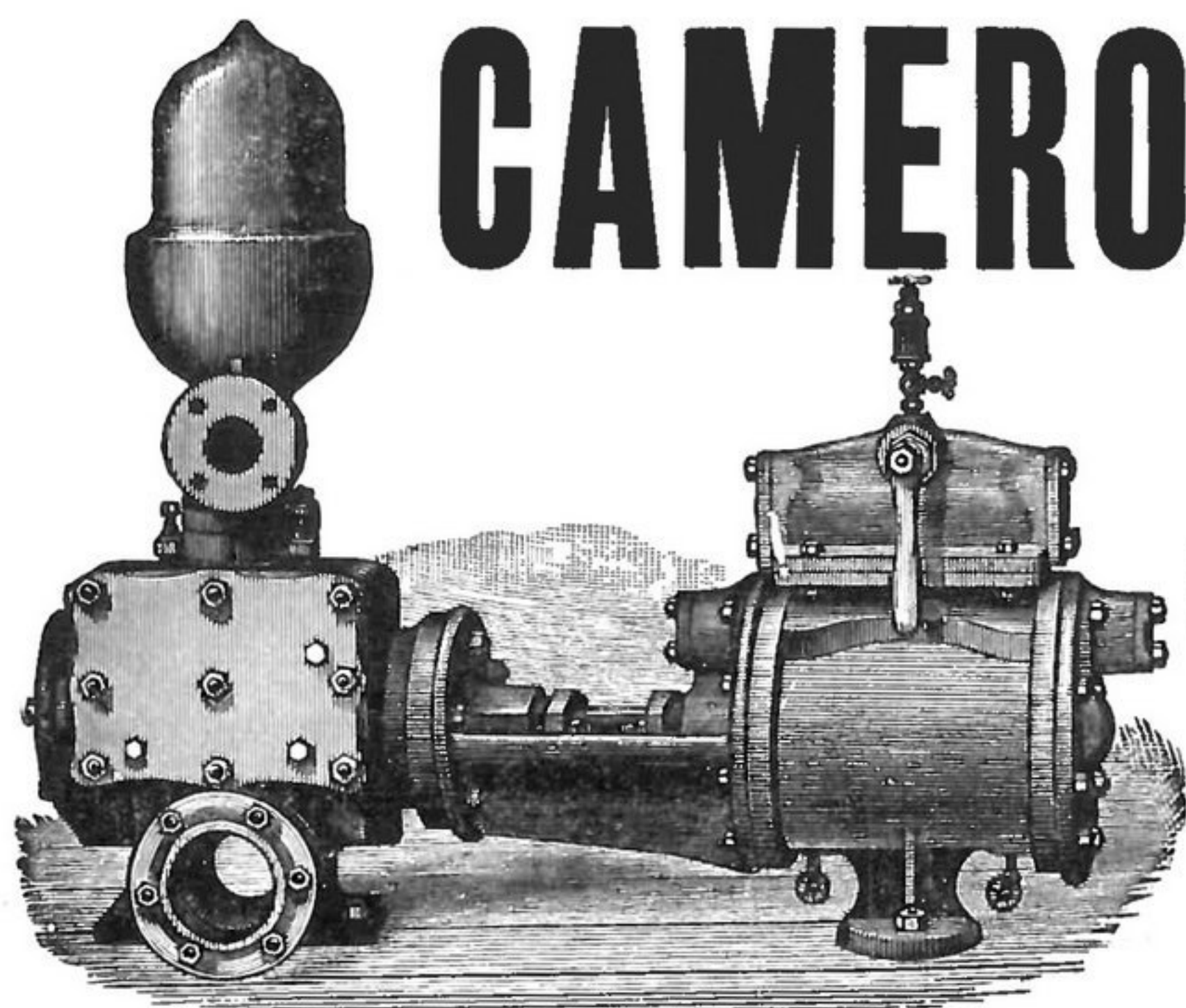
New York, 17 Cortlandt St. } Westinghouse,  
Boston, Hathaway Building, } Church, Kerr  
Pittsburgh, Westinghouse Build'g, } & Co.  
Chicago, 156, 158 Lake St.  
Philadelphia, 608 Chestnut St. M. R. Muehle, Jr. & Co.

**ST. LOUIS,**

511 NORTH FOURTH ST.,

Westinghouse, Church, Kerr & Co.

Salt Lake City, 259 S. Main St. } Utah & Montana  
Butte, Mont. 2. Granite St. } Machinery Co.  
San Francisco, 21, 23 Fremont Street, Parke & Lacy Co.  
Portland, Or. 33, 35 N. Front St. Parke & Lacy Mch. Co.  
Charlotte, N. C. 36 College St. } The D. A. Tompkins Co.  
Atlanta, Ga. 45 S. Prior St. }  
Dallas, Tex. Keating Imp. & Machine Co.  
Chattanooga, Tenn. C. E. James & Co.



# CAMERON STEAM PUMP

THE STANDARD OF EXCELLENCE.

**SIMPLE! COMPACT! DURABLE!**

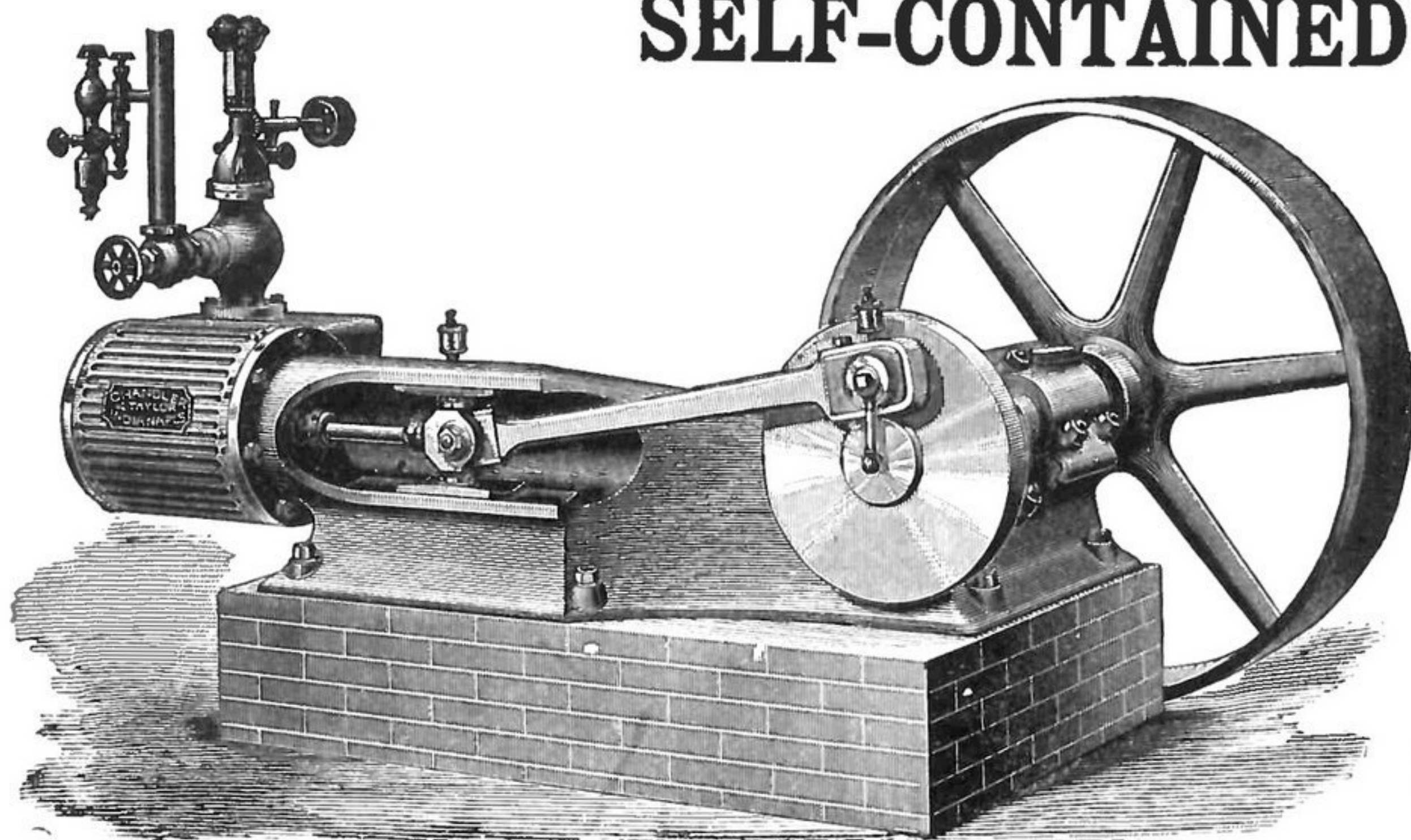
**"NO OUTSIDE VALVE GEAR."**

**Steam, Air & Vacuum Pumps in Every Variety**

FOR ILLUSTRATED CATALOGUE ADDRESS

**THE A.S. CAMERON STEAM PUMP WORKS**

Foot of East 23d Street, - New York.



## SELF-CONTAINED STEAM ENGINES

Stationary or  
Semi-Portable.

High Standard Maintained.  
Prices Greatly Reduced.

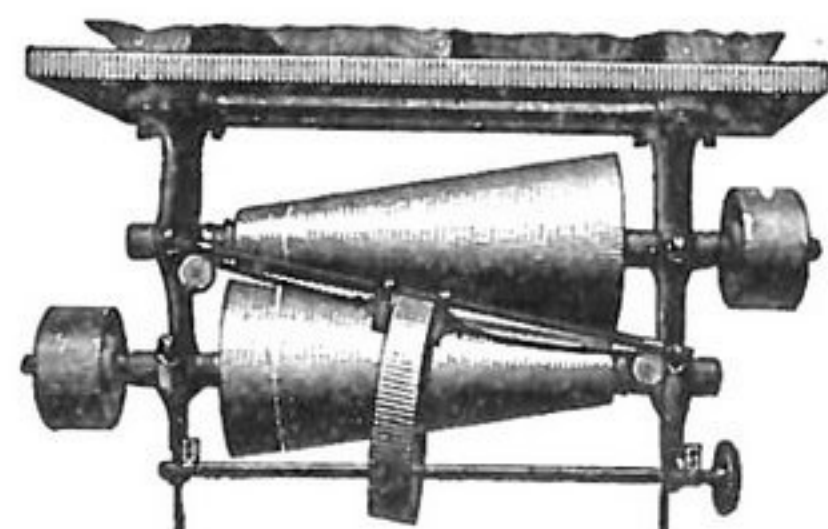
WRITE FOR NEW ILLUSTRATED  
CATALOGUE NO. 32.

**Chandler & Taylor Co.**  
**Indianapolis, Ind.**

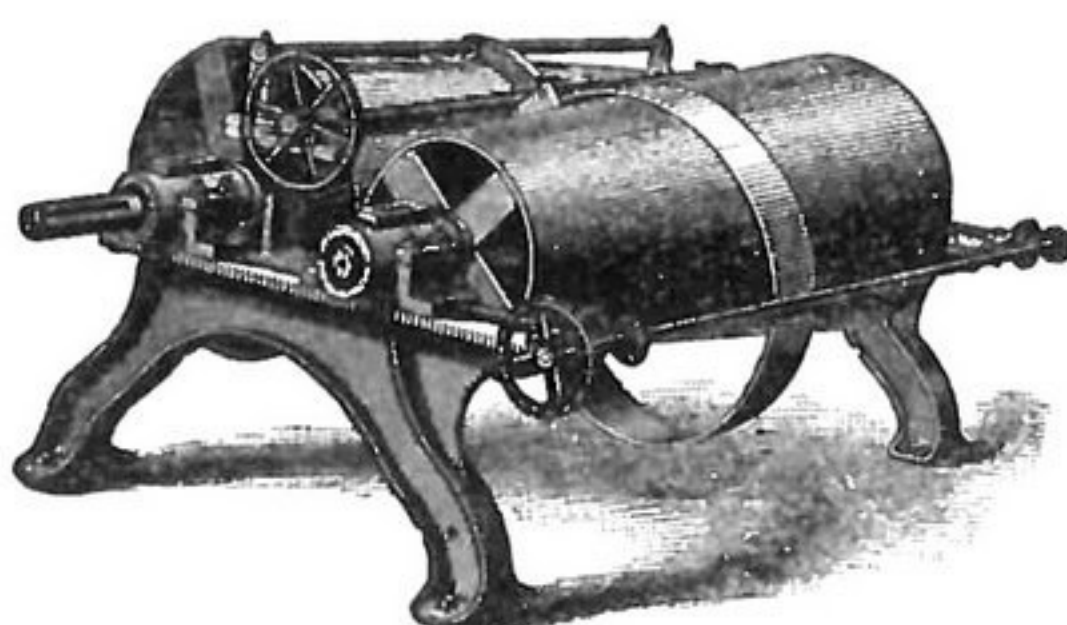
Engines, Saw-Mills and Drain The  
Machinery a Specialty.

## THE EVANS FRICTION CONE & FRICTIONAL GEARING

"PATENTED."



This cut represents a set of hanging cone pulleys. This pattern is intended for that class of machinery that stops and starts at the same speed, and at the same time be able to change the speed more or less while running. These cones are also fitted with a governor where a steady motion is required and the initial power is



fluctuating. All sizes made from 1/2 Horse Power to 50 Horse Power. SEND FOR ILLUSTRATED CATALOGUE.

**EVANS FRICTION CONE CO., 85 Water St., BOSTON.**

## SHIPPERS

CAN SAVE TIME  
AND TROUBLE  
AND CASH

BY USING  
**BARLOW'S**  
PATENT  
MANIFOLD  
**SHIPPING**  
BLANKS. SEND FOR  
SAMPLE SHEET & PRICES  
BARLOW BROS. GRAND RAPIDS, MICH.



# THE Grain & Flour Trade

OFFICE OF THE MILLING WORLD,  
BUFFALO, N. Y., March 29, 1890.

Friday of last week brought activity and irregularity in the grain markets. In New York March wheat closed at 89c., with Atlantic port receipts 43,883, exports 6,019, and options 4,472,000 bushels. March corn closed at 37c., with receipts 390,773, exports 587,903, and options 750,000 bushels. All the strength in corn is at the seaboard, and all the weakness is in the West. March oats closed at 28 $\frac{1}{2}$ c., with receipts 101,924, exports 63,329, and options 640,000 bushels. Wheat flour was up in some lines, so far up on advanced millers' limits that trade was stopped. Receipts included 8,571 sacks and 36,055 barrels, and exports 2,285 sacks and 3,568 barrels. Minor lines ruled featureless.

Saturday brought little change in conditions. Reports on winter-wheat crop conditions were discouraging. March wheat closed at 89 $\frac{1}{2}$ c., just 2 $\frac{1}{2}$ c. below the figure of a year ago. Receipts were 47,462, exports 293,742, and options 1,800,000 bushels. Rumors of a corner in May wheat were heard, but no details leaked out. The bears can not make it appear that the reports of damage to the winter-wheat crop are exaggerated. March corn closed at 36 $\frac{1}{2}$ c., with receipts 307,111, exports 243,555, and options only 232,000 bushels for the half-day. March oats closed at 29c., with receipts 141,677, exports 190,866, and options 155,000 bushels. Wheat flour was again advanced by Minneapolis millers from \$5.05@5.10 on standard patents, car lots bringing \$5. The advance checked trade. Other grades were stronger in sympathy with Minneapolis. Receipts included 7,497 sacks and 29,282 barrels, and exports 7,621 sacks and 2,995 barrels. The other lines were featureless.

Monday brought dull and generally easier markets, in spite of bad crop reports from the winter wheat section. March wheat closed at 89c., with receipts 51,924, exports 59,778, and options 2,250,000 bushels. March corn closed at 36 $\frac{1}{2}$ c., with receipts 224,856, exports 253,307, options 450,000 bushels. March oats closed at 28 $\frac{1}{2}$ c., with receipts 163,000, exports 18,816, and options 225,000 bushels. Wheat flour was very dull, buyers leaving the market severely alone. Receipts were 10,027 sacks and 26,496 barrels, and exports 4,528 sacks and 15,504 barrels. The minor lines were featureless. The visible supply in the United States and Canada was:

	1890.	1889.	
	Mch. 22.	Mch. 23.	Mch. 24.
Wheat .....	27,633,180	30,233,812	35,437,544
Corn .....	18,116,827	17,051,473	9,244,854
Oats .....	4,513,595	7,338,423	4,081,273
Rye .....	1,485,971	1,569,718	355,589
Barley .....	1,497,521	1,602,934	2,010,482

Tuesday brought dull and easier markets on bear crop reports and light demand. March wheat closed at 88 $\frac{1}{2}$ c., with receipts 52,362, exports 176,575, and options 3,334,000 bushels. The English visible supply of wheat increased 700,000 quarters during the past week. Reports from 22 points east of the Rocky Mountains showed 53,447,000 bushels of wheat in store and on passage to the United Kingdom and the Continent, against 48,800,000 bushels a year ago. March corn closed at 36 $\frac{1}{2}$ c., with receipts 551,031, exports 233,873, and options 456,000 bushels. March oats closed at 29c., with receipts 185,689, exports 132,115, and options 380,000 bushels. Wheat flour was extremely dull. Receipts were 14,437 sacks and 43,562 barrels, and exports 12,597 sacks and 20,162 barrels. The minor lines were featureless.

	1890.	1889.	
	Mch. 25.	Mch. 26.	
Wheat and flour, qrs....	2,661,000	1,932,000	
Corn, qrs.....	678,000	272,000	

The following shows the amount of wheat and corn on passage to the Continent for the past week and for the same week last year:

	1890.	1889.	
	Mch. 25.	Mch. 26.	
Wheat, qrs.....	565,000	322,000	
Corn, qrs.....	414,000	256,000	

Shipments India wheat to U. K. .... 5,000  
do do Continent.. 12,500

The imports into the United Kingdom for the past week and for the same weeks in previous years were as follows:

	1890.	1890.	1889.
	Mch. 25.	Mch. 18.	Mch. 26.
Wheat, qrs .....	209,000	164,000	204,000
Corn, qrs.....	276,000	378,000	231,000
Flour, bbls.....	314,000	270,000	176,000

Wednesday brought weaker, lower and more active markets, on warmer weather and im-

proved crop prospects in the winter-wheat regions, on larger receipts and the opening of the Russian shipping ports. March wheat closed down at 87 $\frac{1}{2}$ c., with receipts 46,360, exports 5,532, and options 6,500,000 bushels. March corn closed at 36 $\frac{1}{2}$ c., with receipts 464,349, exports 392,469, and options 1,100,000 bushels. March oats closed at 28 $\frac{1}{2}$ c., with receipts 159,657, exports 43,370, and options 370,000 bushels. Buckwheat grain is dropped from the markets. Rye was steady at the following figures: State 57@58c. afloat; No. 2 Western 57@57 $\frac{1}{2}$ c; Canada 56@57c; Milwaukee 57 $\frac{1}{2}$ @58c; car lots on track 53@56c. Barley was held firmly at late prices, but dull, as stocks and demand are both small. Sales were reported of about 16,000 bushels ungraded Canada at about 60@61c. Quotations: Two-rowed State 46@50c; six-rowed State 53@56c; Canada ungraded 56@65c. Malt was firmly held, but not moving except in a small way from maltsters direct on p. t. Quotations: Two-rowed State, 60@70c; six-rowed 70@75c; country-made Canada, 75@85c; city do, 80@87c. Mill-feed was firm at the late advance, with sales of small lots at 80c., which was refused in cases by mills sold ahead for all next month. Quotations: 77@80c. for the whole list except rye, of which none is offered.

Wheat flour was extremely dull, with buyers and sellers holding off. St. Louis mills were 15c. higher than Ohio and Indiana mills. Minneapolis spring mills were less firm. Exporters' limits were reduced and orders were canceled. Receipts included 14,548 sacks and 24,882 barrels, and exports 11,539 sacks and 15,091 barrels. Rye flour was firmer at \$2.80@3.10. Corn products were quiet at the following quotations: 71@73c. for coarse in bags, 85@88c. for yellow fine, 88@92c. for fine white; \$2.40@2.50 for Western and Southern; \$2.55 for Brandywine.

Thursday brought little change in the markets. March wheat closed at 87 $\frac{1}{2}$ c., with receipts 2,400, exports 45,973, spot sales 216,000 bushels, and options 4,640,000 bushels. March corn close at 36 $\frac{1}{2}$ c., with receipts 46,800, exports 91,686, spot sales 263,000, and options 760,000 bushels. March oats closed at 28 $\frac{1}{2}$ c., with receipts 67,000, spot sales 138,000, and options 380,000 bushels. Wheat flour was active and steady, with receipts 23,653 packages, and sales 21,300 barrels. Sales were made at the following prices: Low extras \$2.15@2.65; city mills \$4.25@4.45; city mills patents \$4.75@5.15; winter wheat low grades \$3.15@3.65; fair to fancy \$2.85 @ 4.50; patents \$4.35 @ 5.00; Minnesota clear \$3.35@4.20; Minnesota straights \$3.85@4.65; Minnesota patents \$4.50@5.25; Minnesota rye mixtures \$3.35 @ 3.90; superfines \$2.10@2.50. The other lines were featureless. The Minneapolis mills turned out 133,720 barrels of flour last week.

## BUFFALO MARKETS.

WHEAT—The market here was quiet but steady. No. 1 Northern sold at 92c. and 11,000 bushels of No. 2 Northern sold at 87 $\frac{1}{2}$ c., but at the close it was held at 88c. A lot of 32,000 bushels of No. 1 hard was sold for New York at 98 $\frac{1}{2}$ c. which is 12 $\frac{1}{2}$ c. over Chicago May. No. 2 red winter sold at 85c. and No. 1 white is held at 87c. At the close No. 1 hard was held at 92 $\frac{1}{2}$ c. and No. 1 No. 1 Northern 92 $\frac{1}{2}$ c. CORN—The market is strong and sales of No. 3 corn and No. 4 Northern were made at 35c. No. 3 yellow is held at 35 $\frac{1}{2}$ @36c. No one cares to sell "to arrive" on a rising market. OATS—Little was done in oats to-day. Prices remain at about 28 $\frac{1}{2}$ @39c. for No. 2 white, and 26 $\frac{1}{2}$ @26 $\frac{1}{2}$ c. for No. 2 mixed. RYE—There is no improvement trade here. Quotations are at 50c No. 2. BARLEY—There is some inquiry, but only for the cheap grades. No. 1 Canada is quoted at 63@65c. No. 2 at 58@60c. No. 3 at 52@54c, and Western at 40@46c. OATMEAL—Akron, \$6.00; Western, \$5.75 per bbl.; rolled oats, in cases, 72 lbs., \$3.25. CORNMEAL—Coarse, 80@85c.; fine, 85@90c.; granulated, \$1.50 per cwt. MILLFEED—City-ground coarse winter, \$13.50@14.00 per ton; fine do. \$14.50@15.50; finished winter middlings, \$15.00@15.50; coarse spring do, \$13.00@13.50.

## FLOUR MARKET.

Spring Wheat.	Winter Wheat.
Patents..... \$5.50@6.00	Patents ... \$4.75@5.25
Straight..... 4.50@5.00	Straight..... 4.25@4.75
Bakers..... 3.50@4.00	Clear ... 3.75@4.25
Red Dog. . . 2.25@2.75	Low grades . 2.50@3.00

Retail prices 50c per bbl above these quotations. Buckwheat flour \$1.40@1.75 per 100 lbs.

## PRACTICAL BOOKS FOR Practical Men

By ROBERT GRIMSHAW, M. E.

Steam Engine Catechism..complete.....	\$2.00
Boiler Catechism.....	2.00
Pump Catechism.....	1.00

These Catechisms give plain, correct, practical answers to practical questions, such as would be asked candidates for positions, licenses, or admission to engineering societies. No high science; no mathematical gymnastics. Popular style. Up to date.

Sent post-paid to any address on receipt of price by

McFAUL & NOLAN,

Drawer 203, Buffalo, N. Y.

## CORNISH'S (OLD ESTABLISHED) ORGANS (AND RELIABLE) AND PIANOS!

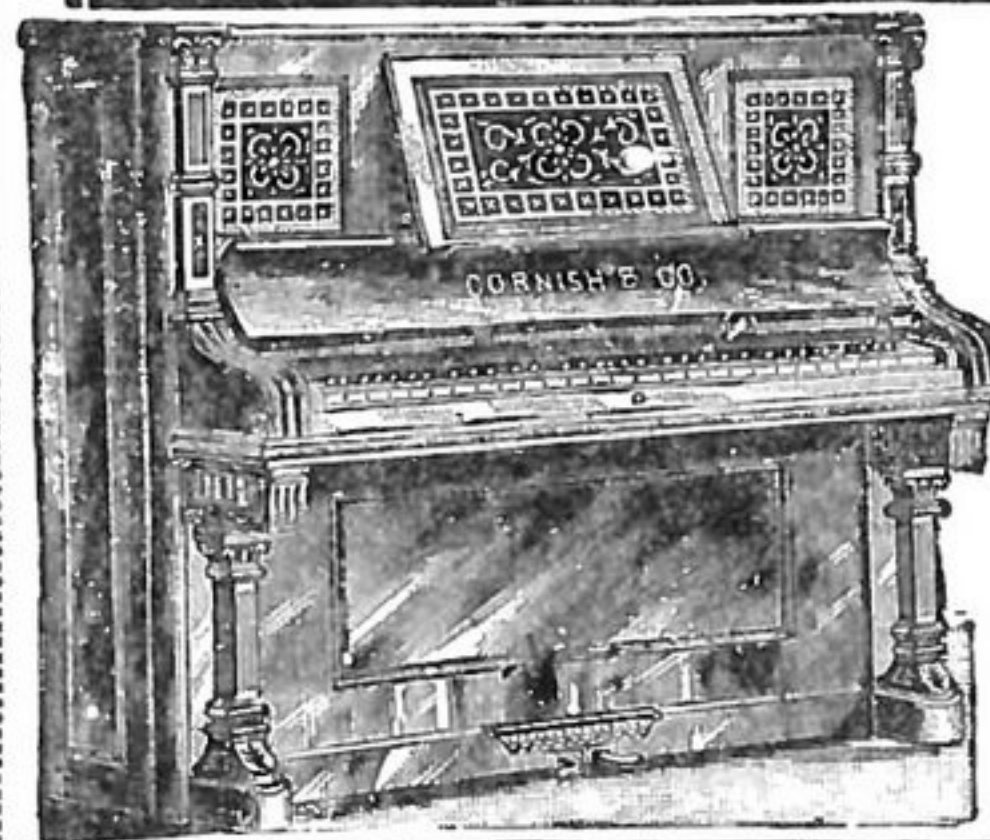
THE ONLY FIRM OF MANUFACTURERS IN AMERICA  
selling direct to Consumer. From Factory to Family at Wholesale Rates on Terms to suit Purchaser.

**\$75 ORGAN** { EXACTLY LIKE THIS CUT } **\$50**  
**\$15.00 CASH** **SOLD FOR** After ten days' trial,  
price, \$35, to be paid in 7 monthly in-  
stallments of \$5 each. OR IF CASH IS SENT WITH  
ORDER, WE WILL SPECIALLY ACCEPT \$45.00.

CORNISH'S Specially designed Cabinet Organ, Style "Canopiletta," No. 10,000, contains 3 sets Orchestral toned Resonatory Pipe Quality Reeds; 5 Octaves; 10 Solo Stops; 2 Octave Couplers (Bass and Treble); 2 Knee Swells and all late improvements.  
Dimensions.—65 in. high, 48 long, 21 wide.

WARRANTED FOR TEN LONG YEARS.  
SOLD WALNUT CASE, HIGHLY FINISHED.  
Handsome stool and large Instruction Book, making a Complete Musical Outfit.

**HOW TO ORDER.** Send a reference as to your responsibility from any Banker, Postmaster, Merchant or Express Ag't, and Organ will be shipped at once on Ten Days' Test Trial, and if not, after trial, satisfactory, you can return it and we will pay freight charges both ways. (YOU RUN NO RISK.)



REFERENCES.—FIRST NATIONAL BANK, WASHINGTON, N. J., any Commercial Agency in the U. S., and thousands of persons who for the last 20 years have purchased instruments of our manufacture.

## CORNISH'S GRAND, SQUARE PIANOS AND UPRIGHT

Magnificent New Designs, finest materials, wholesale prices, upon terms to suit all purchasers. Shipped to any part of the civilized world, on free test trial.

**NO MONEY REQUIRED UNTIL YOU ARE SATISFIED.**  
We want every reader of this paper to **WRITE TO-PAY** for our 20 pp. Illustrated Catalogue. YOU CAN SAVE MONEY. WRITE whether you want to buy now or not. Our Catalogue will interest you and you can get it for nothing.

Address: **CORNISH & CO. (OLD ESTABLISHED) WASHINGTON, (AND RELIABLE,) NEW JERSEY.**





**RELIANCE OIL & GREASE CO., CLEVELAND, O..**

— MANUFACTURERS OF —

**Finest Lubricants for Milling Plants. A Challenge to the World.**

WRITE US.

"VALVE OLEINE"—675 Degrees Fire Test, Cylinder Oil.

"CHIEF"—Roller Mill Lubricant.

"NIAGARA"—Belt Grease.

"RUSSIAN"—Engine and Machine Oil.

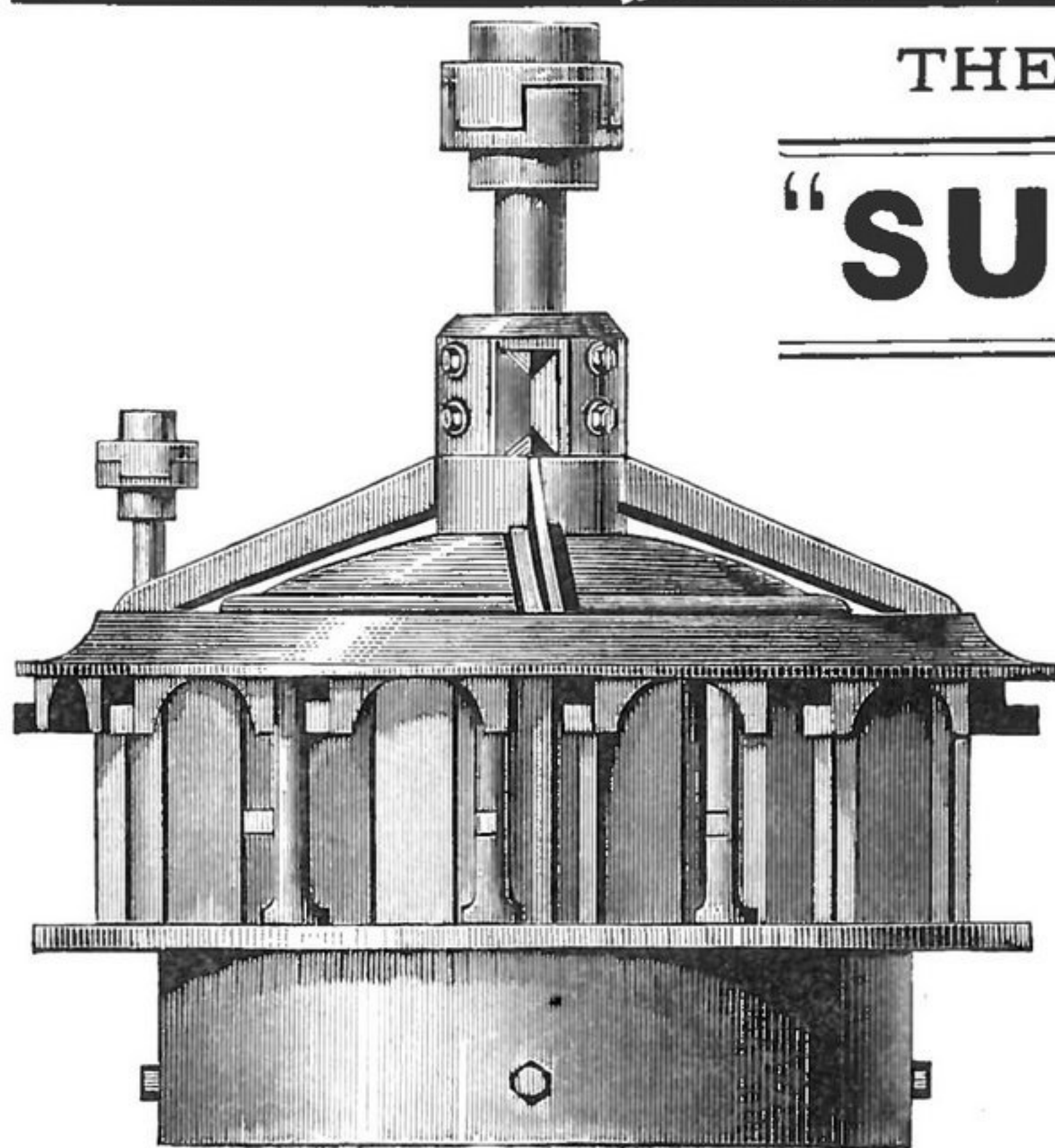
"ANCHOR"—Roller Mill Grease.

"CHELSEA"—Scale Solvent, Best on Market.

Agents Wanted.

**FREE—SAMPLES, CATALOGUE, AND ALL INFORMATION.**

SPECIAL  
HIGH GRADE  
PRODUCTS



## THE IMPROVED "SUCCESS"

### PERCENTAGE:

Full Gate, - - 86.29

$\frac{7}{8}$  Gate, - - - 86.07

$\frac{3}{4}$  Gate, - - - 81.90

— (:0) —

This Wheel is Both Durable and Cheap. Send for Pamphlet to

**S. MORGAN SMITH**  
YORK, - PA.

SAMPLE OF

## C. O. BARTLETT'S PRICES

FOR STEEL ELEVATOR BUCKETS AND BELTING.

STEEL ELEVATOR  
BUCKETS.

SIZE.	PRICE.
3x3 .....	4c
4x3 .....	6c
5x4 .....	9c
6x4 .....	13c
8x5 .....	18c

LEATHER.

SIZE.	PRICE.
4 inch .....	20c
5 " .....	25c
6 " .....	32c
8 " .....	40c
10 " .....	52c

RUBBER.

SIZE.	PRICE.
4 inch .....	13c
5 " .....	17c
6 " .....	20c
8 " .....	28c
10 " .....	36c

COTTON.

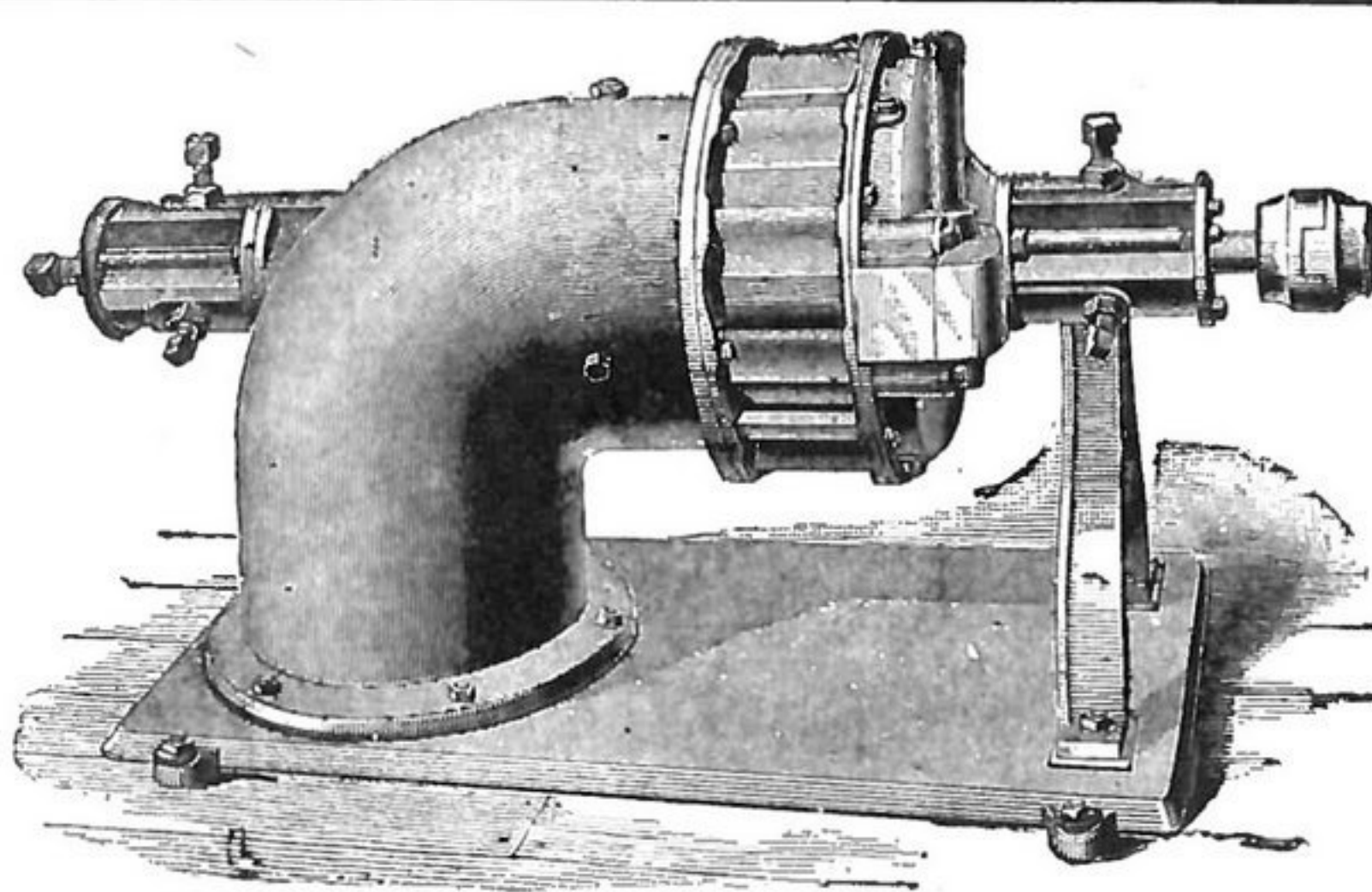
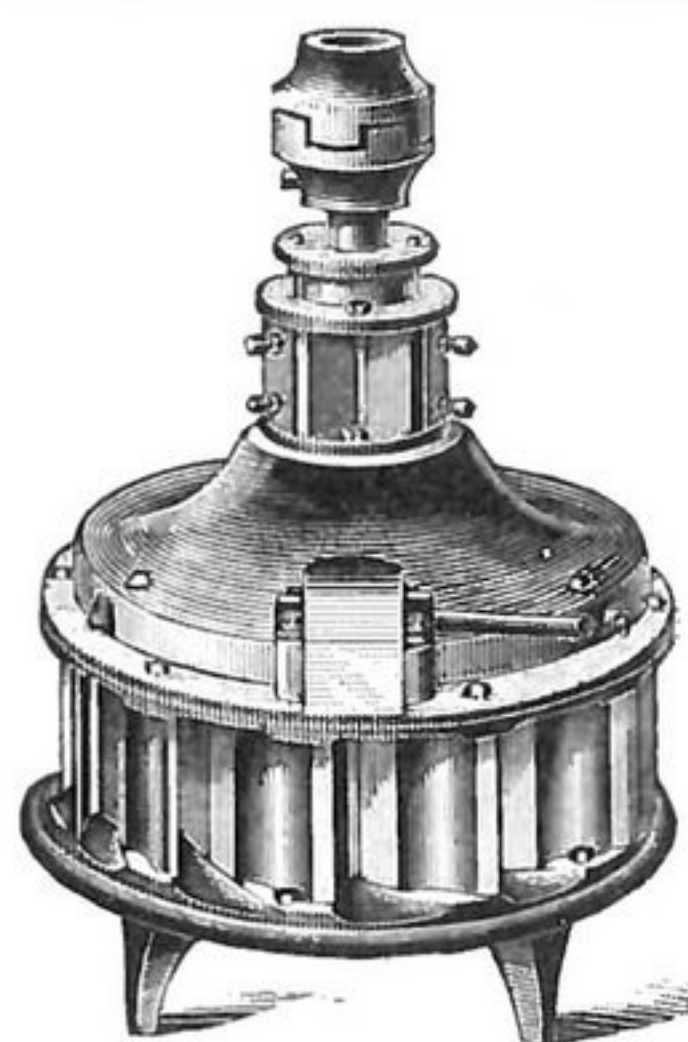
SIZE.	PRICE.
4 inch .....	7c
5 " .....	8c
6 " .....	10c
8 " .....	13c
10 " .....	16c

**C. O. BARTLETT, CLEVELAND, OHIO.**

**WHEN WRITING TO ADVERTISERS**

PLEASE MENTION

**THE MILLING WORLD.**



**BURNHAMS NEW IMPROVED  
STANDARD TURBINE WHEEL,**  
ON VERTICAL OR HORIZONTAL SHAFT.

IT WILL PAY INTERESTED PERSONS TO INVESTIGATE THE MERITS OF THIS WHEEL BEFORE PLACING THEIR ORDER. SEND FOR NEW CATALOGUE.

**BURNHAM BROS., YORK, PA.**

### "ELECTRIC" BELT DRESSING.

A WONDERFUL LEATHER PRESERVATIVE, suitable for Leather, Rubber, Cotton or Rawhide Belting. Belts dressed with this dressing will last twice as long and transmit 100 per cent. more power. Save your Belting and prevent heating of journals by running them under a reduced tension. Sold on approval to responsible parties. SEND FOR CIRCULARS.

**BUFFALO SPECIALTY MFG. CO..**  
67 & 69 Washington Street, BUFFALO, N. Y.

**L. L. WHITLOCK,**  
**Advertising Agent**

FOR MANUFACTURERS.  
**TRADE JOURNALS A SPECIALTY.**  
P. O. DRAWER 5323. **Boston, Mass.**

As Agent for Advertisers instead of Papers, I obtain the Best Rates Possible for my Customers.



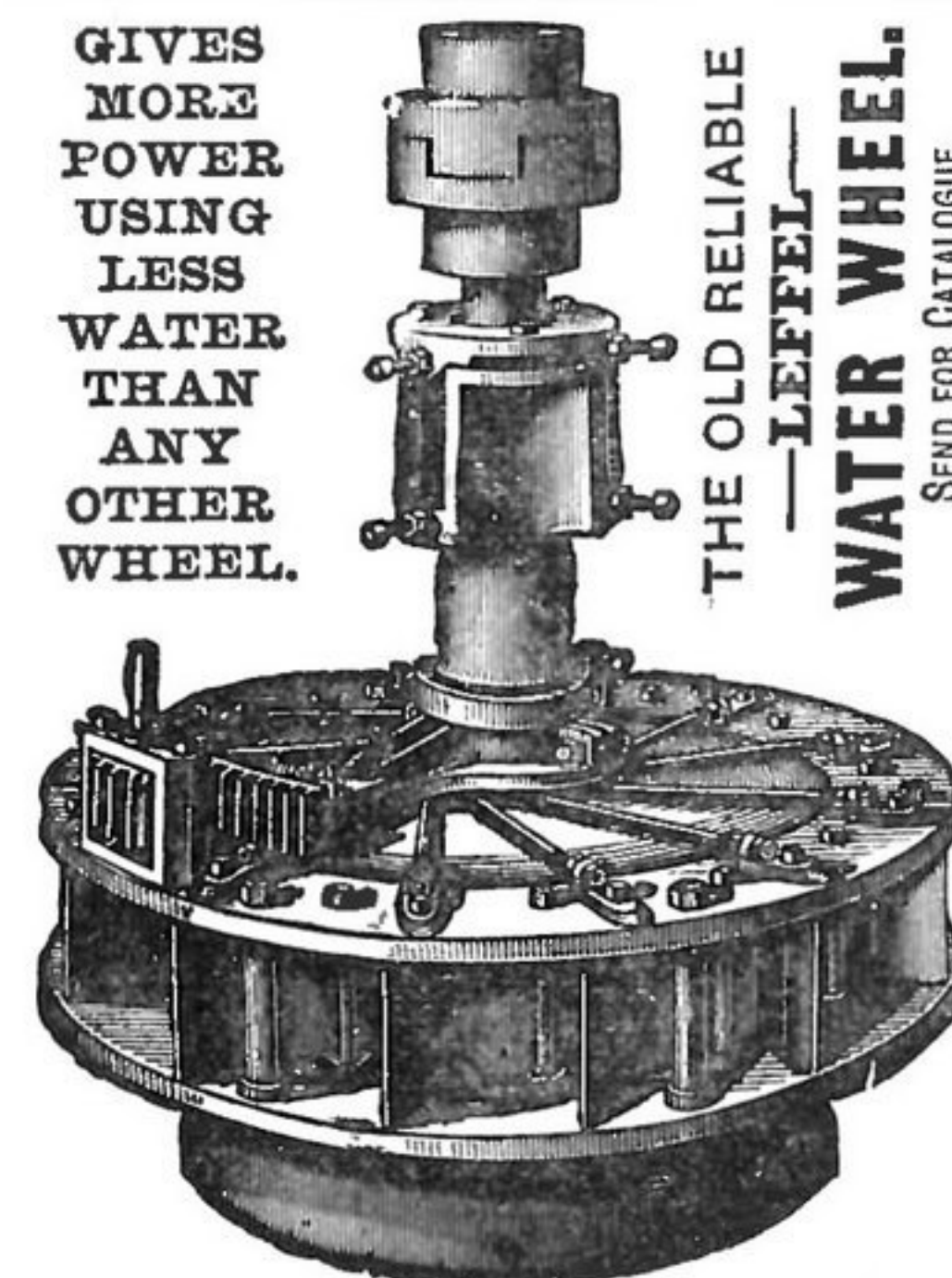
THIS WHEEL GIVES HIGH RESULTS, AND IS ACKNOWLEDGED THE BEST, MOST PRACTICAL AND EFFICIENT TURBINE MADE. FOR SIMPLICITY, DURABILITY, AND TIGHTNESS OF GATE IT HAS NO EQUAL.

State requirements and send for Catalogue to  
**T. C. ALCOTT & SON,**  
**MOUNT HOLLY, N. J.**

GIVES  
MORE  
POWER  
USING  
LESS  
WATER  
THAN  
ANY  
OTHER  
WHEEL.

THE OLD RELIABLE  
—LEFFEL—  
WATER WHEEL.

SEND FOR CATALOGUE  
**JAMES LEFFEL & CO.**  
SPRINGFIELD, O., OR 110 LIBERTY ST., N. Y.



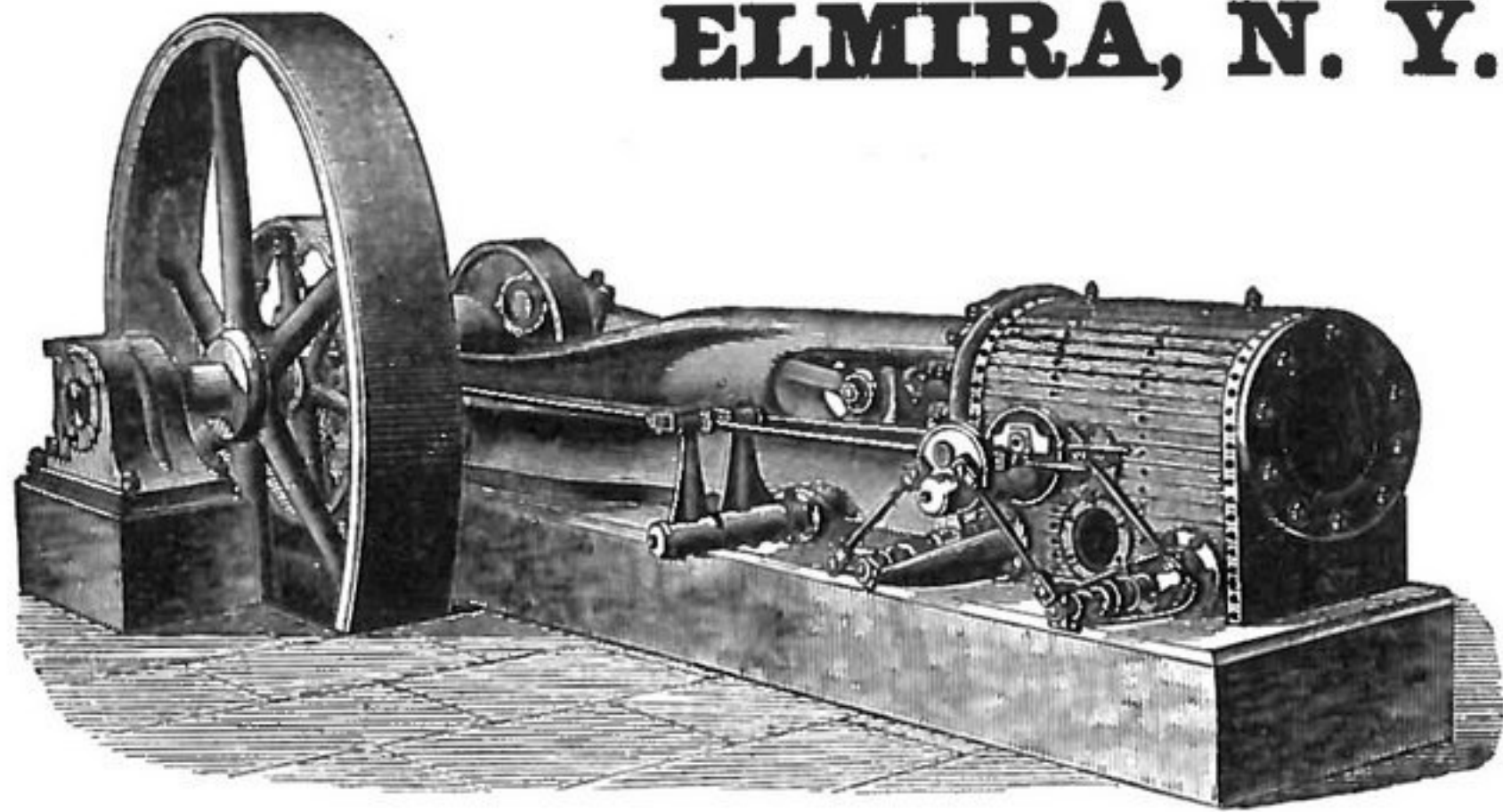


# PAYNE HIGH SPEED CORLISS ENGINE

SHAFT GOVERNOR COMBINED WITH CORLISS WRIST-PLATE.  
ECONOMY OF FUEL.

REGULATION EQUAL TO ANYTHING IN USE.

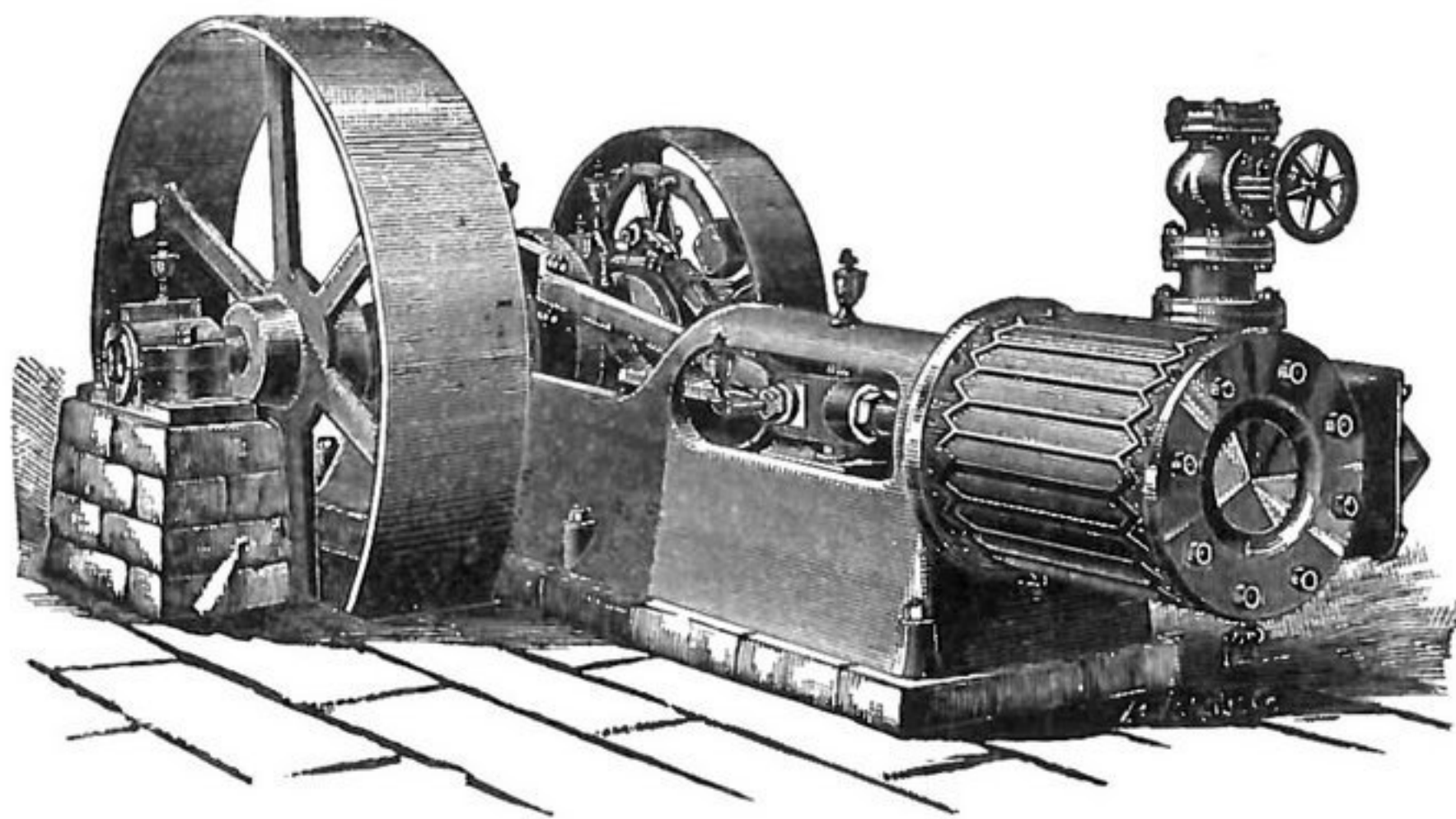
**B. W. Payne & Sons,**  
**ELMIRA, N. Y.**



10 S. Canal Street.  
CHICAGO, ILL.  
45 Dey Street  
NEW YORK.  
Hill, Clark & Co.  
BOSTON, MASS.

AUTOMATIC ENGINES FROM 2 TO 200 HORSE POWER.

## Economic Power Plants



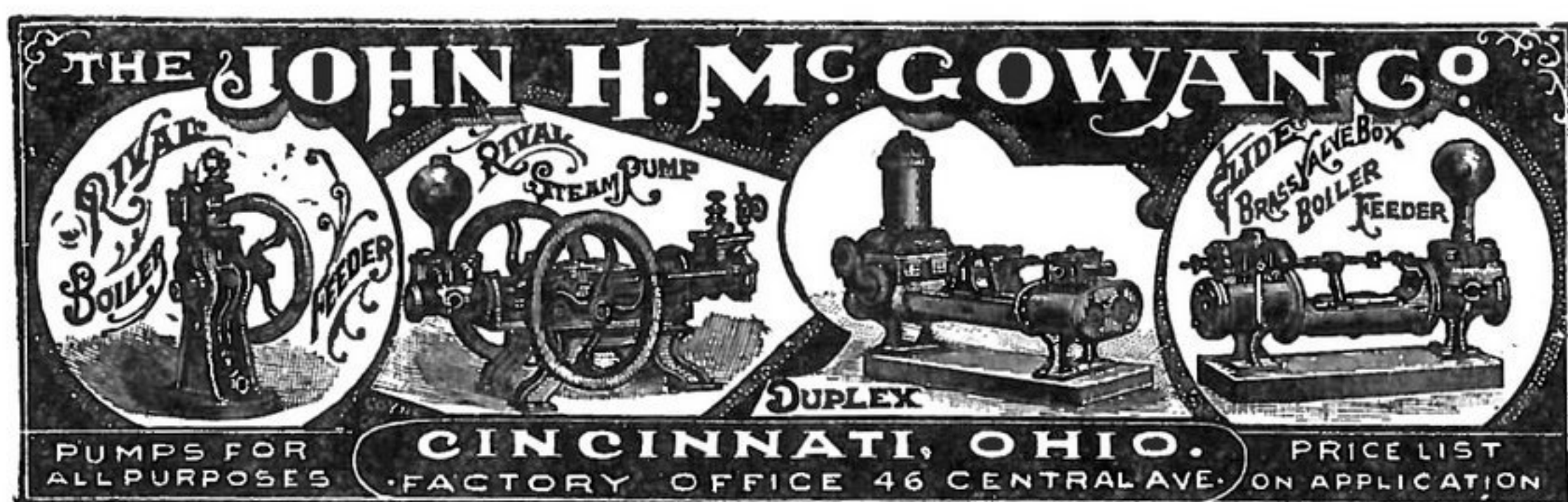
Especially Adapted to Electric Lighting and

**WOOD-WORKING ESTABLISHMENTS**

MANUFACTURED BY

**VALLEY IRON WORKS, WILLIAMSPORT, PENN.**

Please Send for Our New Catalogue and Mention "The Milling World."



BRANCH HOUSE, 1425 EAST MAIN STREET, RICHMOND, VA.

# Lloyd & Sterrett

COR. 16TH AND STATE STREETS,  
ERIE, - - PENN.

THIS SPACE BELONGS TO  
**LLOYD & STERRETT**  
ENGINES AND BOILERS,  
ERIE, - - PENN.

# Lloyd & Sterrett

COR. 16TH AND STATE STS.,  
ERIE - - PENN.



**MOORE'S  
PATENT**

**BARREL HEATER.**

For all  
kinds of coop-  
erage. Thousands  
in use in all parts of the  
U. S. Send for Circular.

JOLIET STOVE WORKS. JOLIET ILL.



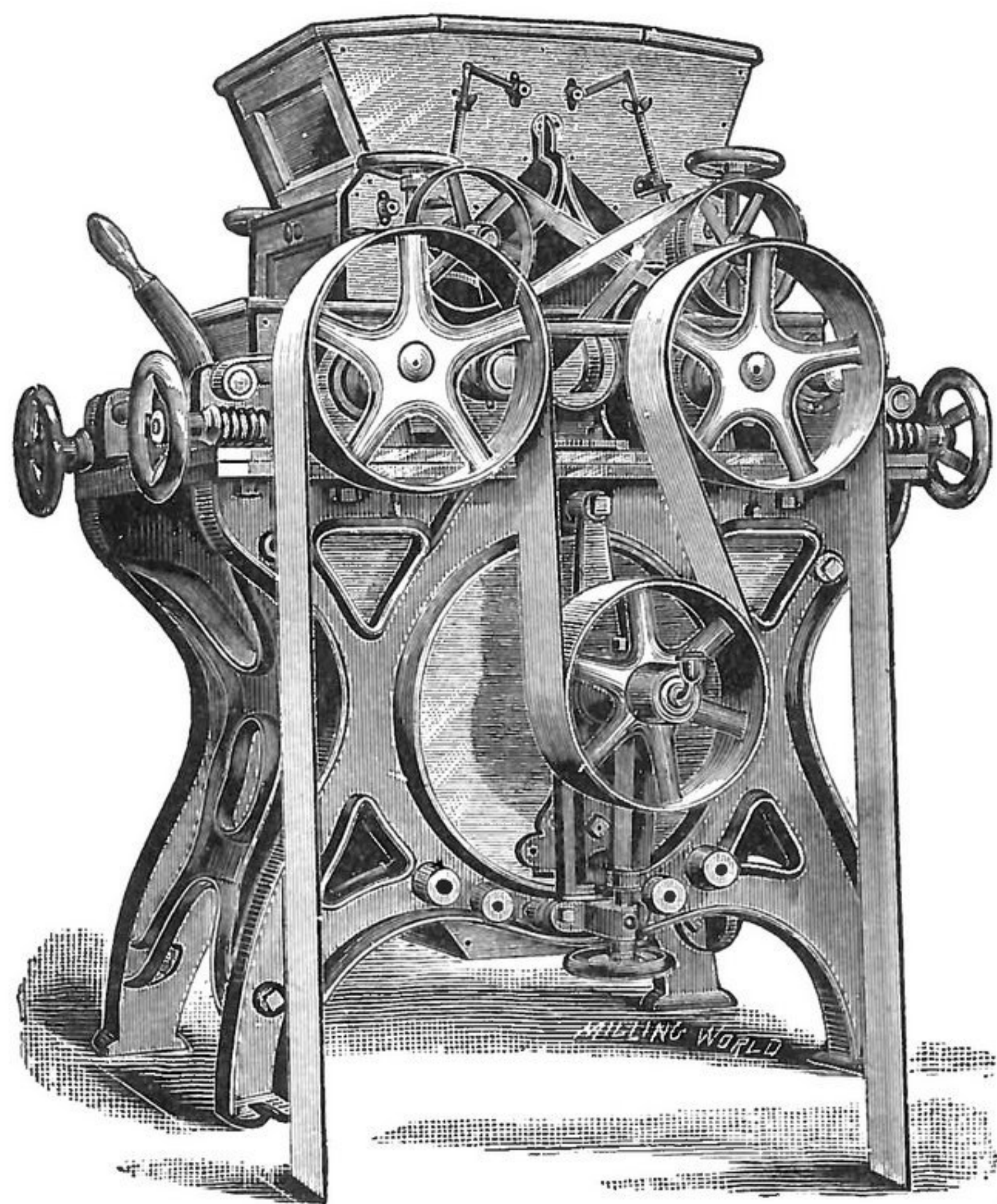
# KEEP YOUR BELTS FROM SLIPPING

And Save Your Power by Using FRICTION COVERING for Pulleys. Agents  
Wanted. Satisfaction Guaranteed- Easily Applied. No Rivets. Effective.

**NATIONAL PULLEY COVERING CO., BALTIMORE, MD.**



# JOHN HUTCHISON MFG. CO., Mill Builders and Mill Furnishers.



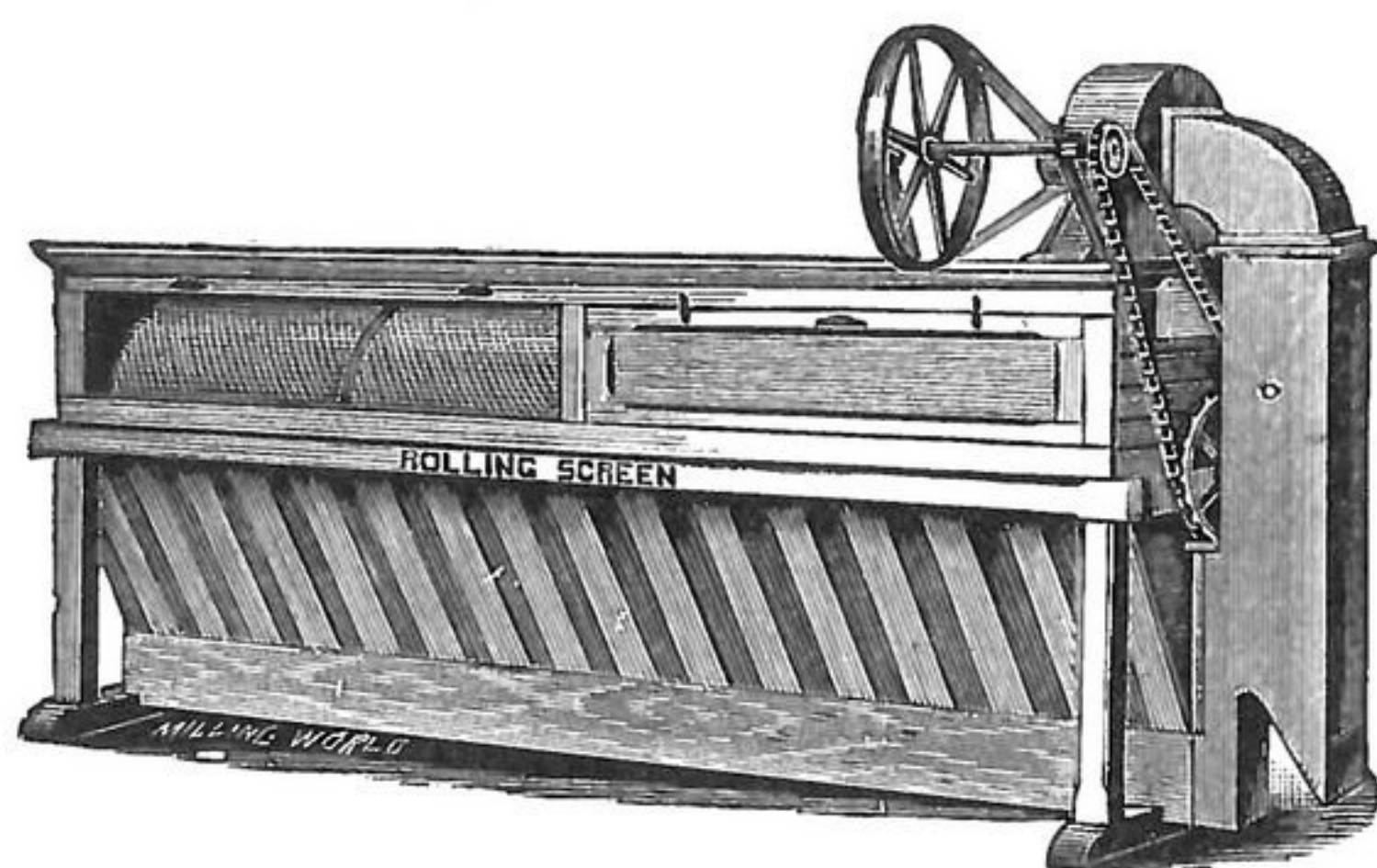
"The Rickerson." The original six inch 4 Roller Mill. We now own the patents on this mill and after greatly improving the mill manufacture them in four sizes:

6x12 inch.

6x18 inch.

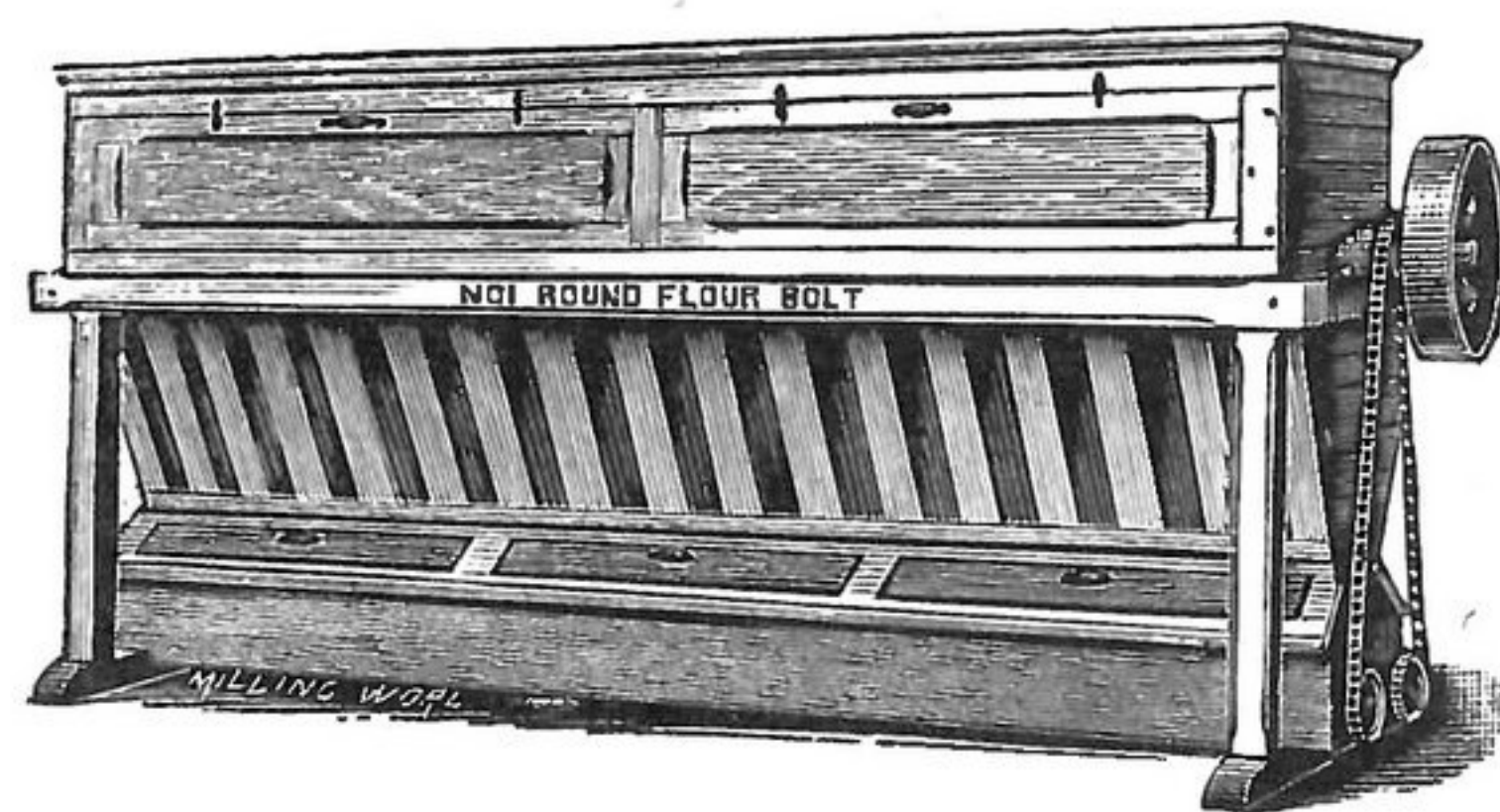
6x15 "

6x20 "

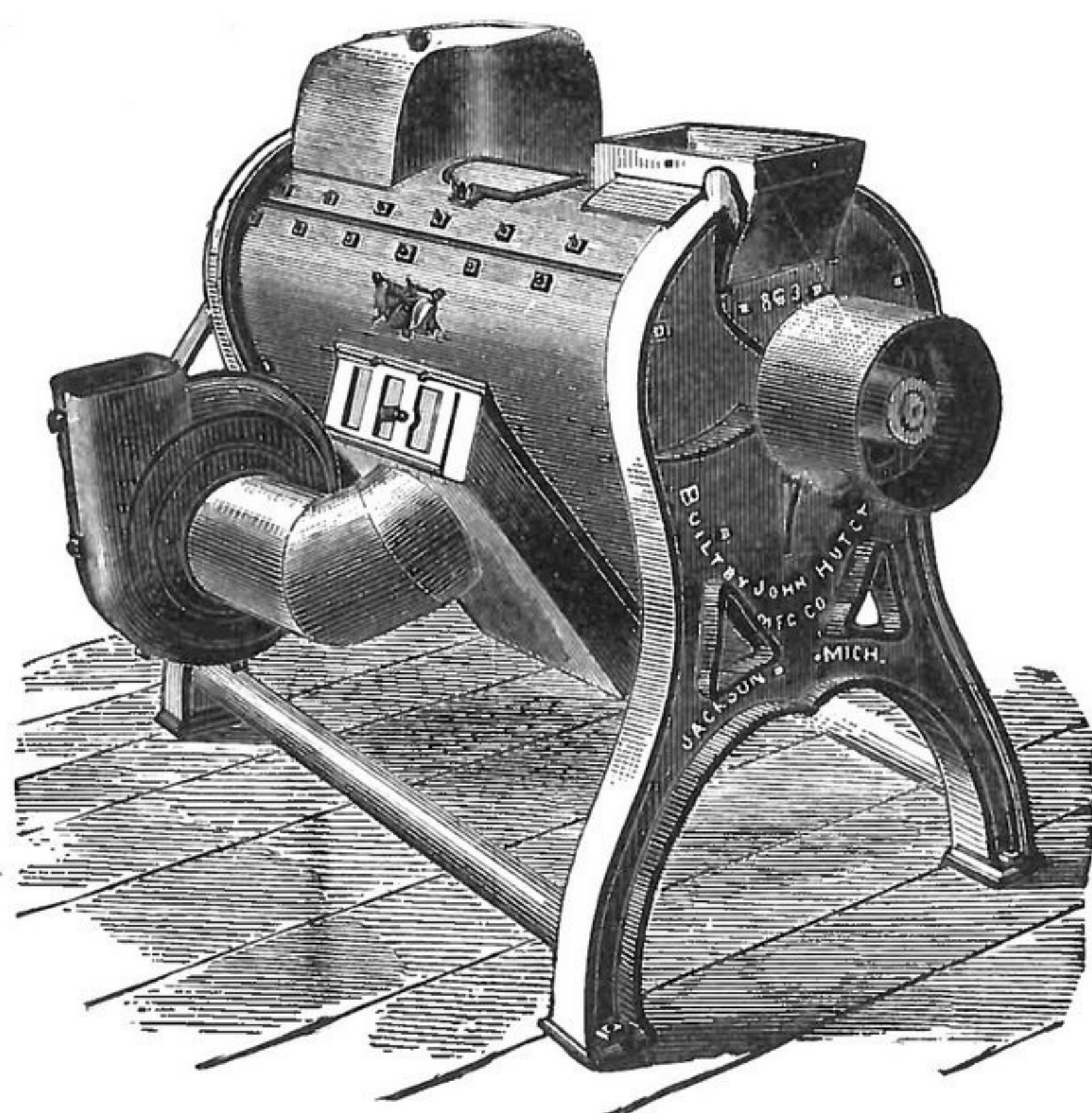


The above cut represents our New Rolling Screen, which is absolutely dustless and has as much scouring qualities as any two scouring machines now being made.

Send for Estimates for Our Full Roller Mills of any Capacity.



The above cut shows our New Round Slow Running Flour Bolt. We also build a Cylinder or Round Scalping Reel and we have lately built a number of new mills of medium capacity, using our Roller Mills, our Round Flour Bolts and Scalping Reels, getting better results than is usually obtained.



Hutchison's New Dustless Iron Corn Sheller, especially adapted for Mill and Elevator use.

—:ADDRESS ALL CORRESPONDENCE TO:—

## John Hutchison Mfg. Co.

JACKSON. . . MICHIGAN.





ELEVATOR BUCKET.

## ✻ CORRUGATIONS ✻

What we know of corrugations can be found out by writing to US, or H. W. Caldwell, Chicago, Ill.

Stamping and Pressing of Sheet Metals for all Classes of Work. Also Tinning, Galvanizing and Japanning.

THE AVERY STAMPING CO.,

Cleveland, Ohio, U. S. A.

New York Office, 51 Cliff Street, HALL & NEAR, Agents.



CALDWELL'S PATENT.



SELF-TRAMMING

## PORTABLE MILL

BEST GRINDING MILL MADE.

## BOLTING CLOTH

AND

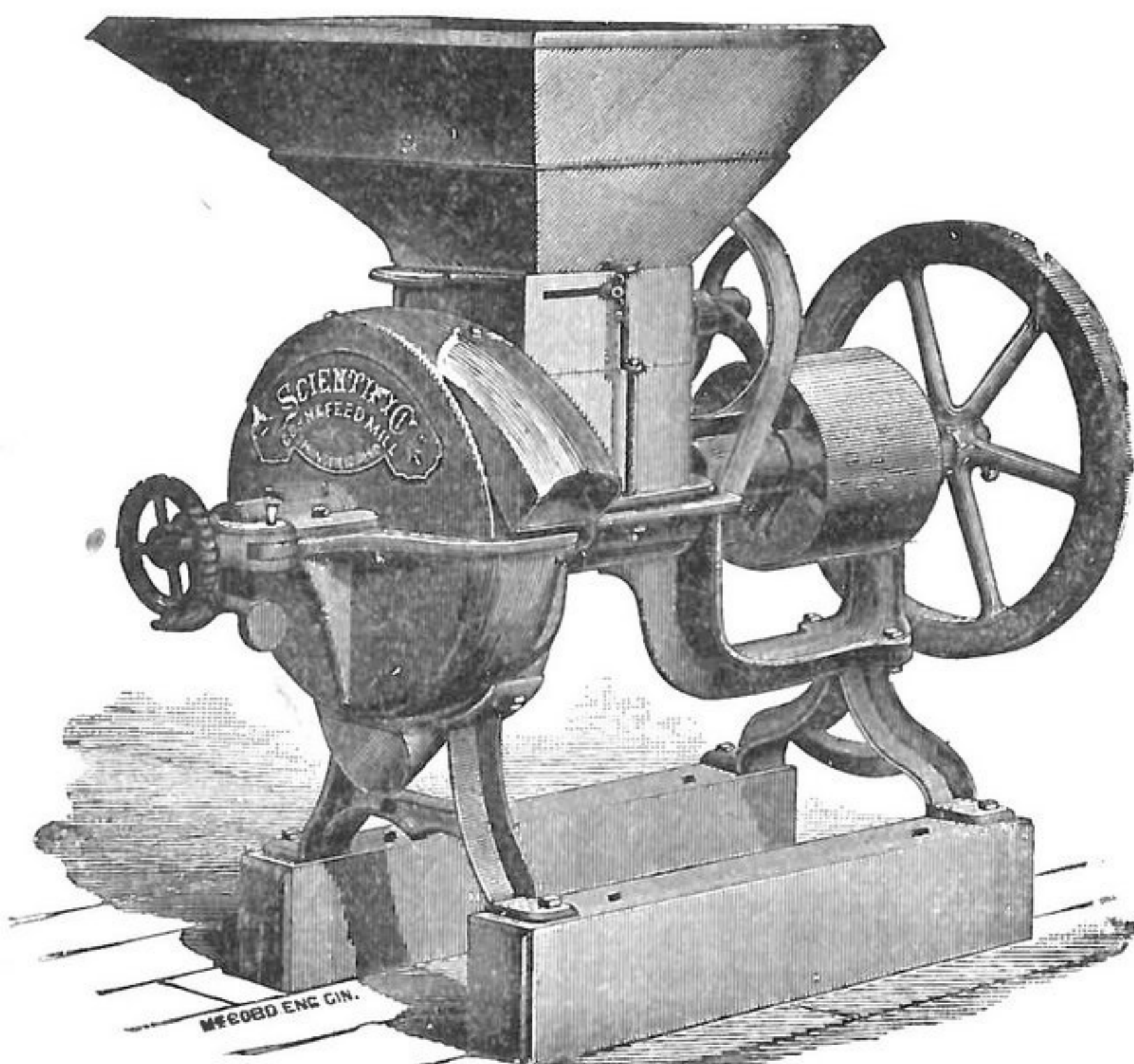
## BURR AND ESOPUS MILLSTONES

WRITE FOR DISCOUNTS.

## SAMUEL CAREY,

17 Broadway,

NEW YORK.



## THE SCIENTIFIC GRINDING MILL.

POSITIVELY THE BEST MILL ON EARTH.

GRINDS PERFECTLY, EAR CORN, SHELLLED CORN, AND ALL GRAINS.

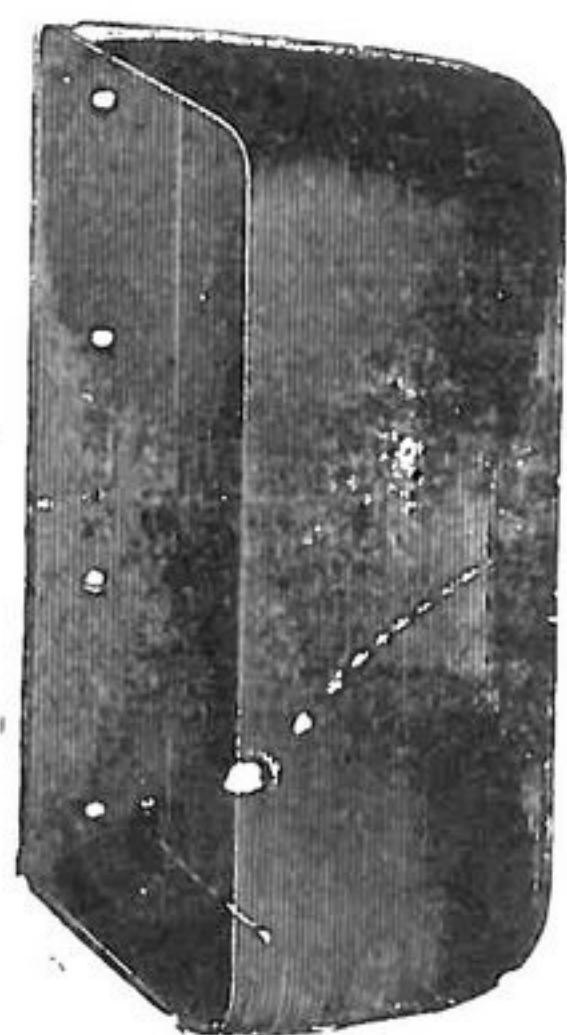
## GRINDING PLATES A SPECIAL METAL

*Hard as Steel, Guaranteed to Grind from Five to Eight Thousand Bushels before wearing out.*

SEND FOR ILLUSTRATED CATALOGUE, PRICES, ETC.

## THE FOOS MFG. CO.

SPRINGFIELD OHIO.



## STILL ON TOP.

Perhaps the **HIGHEST COMPLIMENT** that could be paid the "Salem" bucket is the fact that during the past few years ITS SHAPE HAS BEEN SO CLOSELY IMITATED by other manufacturers as to infringe our patented rights, but experience reveals the **IMPERFECTIONS OF IMITATIONS**, and we therefore take it as a **FURTHER COMPLIMENT** to the "SALEM" bucket that some of its old patrons who were *Induced to Try the Imitations* have now *Returned to the Salem Bucket, thereby Acknowledging it to be the Most Satisfactory*. Don't be deceived by other makes of buckets that are claimed to be "Just as Good." Insist upon having the **ORIGINAL AND RELIABLE SALEM BUCKET**. All legitimate Salem buckets are plainly marked with the word

## SALEM

**W. J. CLARK & CO.,** SOLE Manufacturers **SALEM, OHIO.**

**THORNBURGH & GLESSNER, General Agents, CHICAGO, ILL.**